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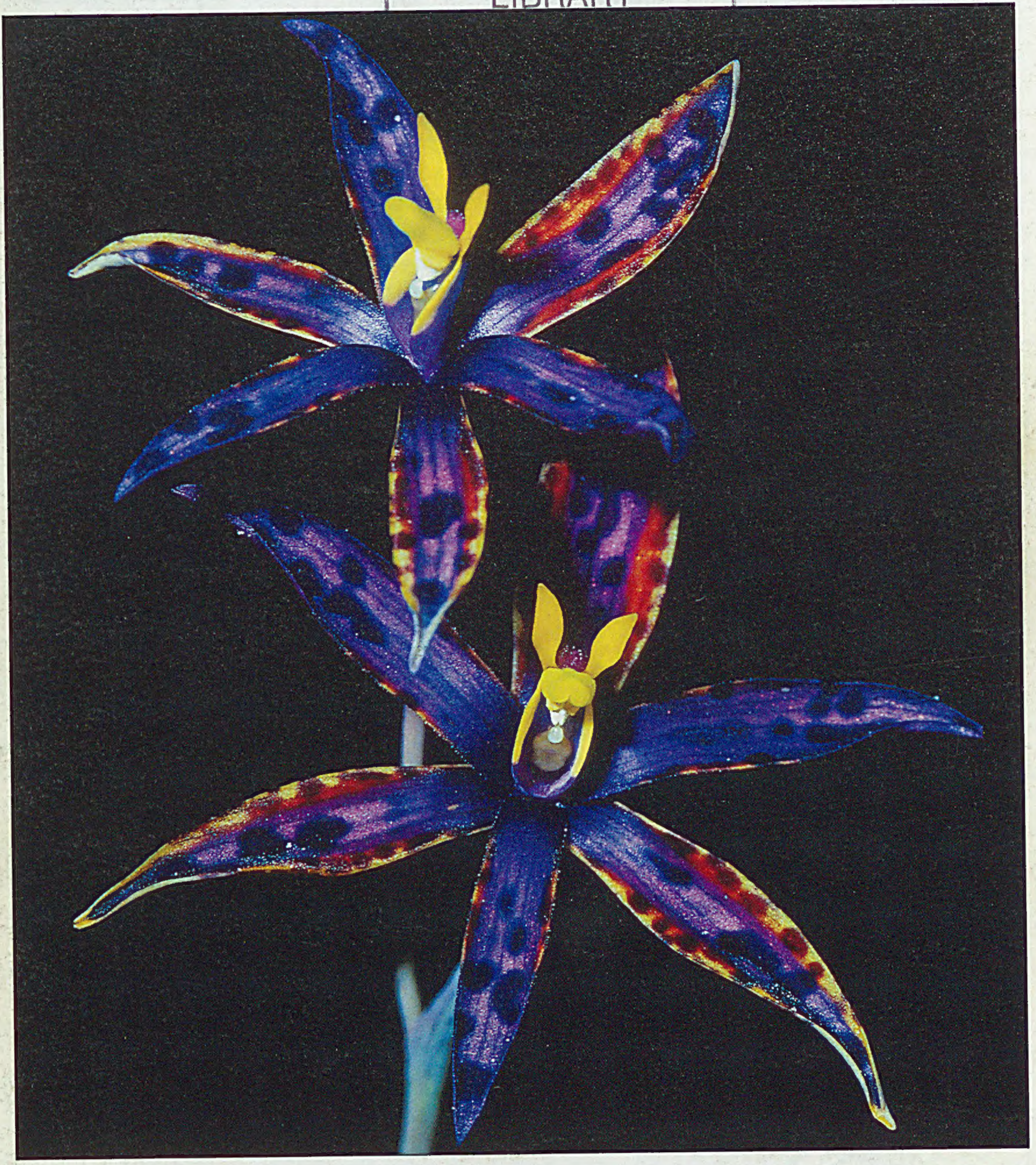


R.L. Heberle

Thelymitra variegata

The "Queen of Sheba" from Albany, Western Australia

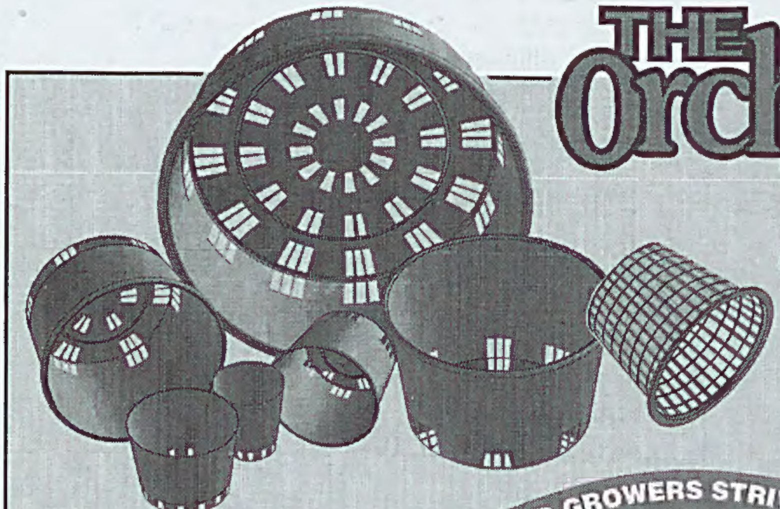
From the Editor...

Spring is finally here and the show season is now upon us. Have you noticed that it is generally the specimen plants that attract the most attention from the public at shows? Yet, where do all the "die hards" invariably congregate? Yes, you guessed it, around the Hybrid Seedling classes. This is where all the future champions start out in life. Seedlings are certainly the window to the future. I find it ironic that you can easily purchase many fine (and often awarded) divisions and/or mericlones of exotic orchid hybrids; then try buying a piece of a showbench *Dendrobium* or *Sarcochilus* hybrid.

Congratulations to our Conservation Officer, Alan Dash, who was one of thirty recipients of the 1999 Premier's Seniors Achievement Awards. Alan was recognised for his work with ANOS and the National Parks and Wildlife Service. At the recent (August 1999) ANOS Annual General Meeting, Alan was also bestowed Life Membership of ANOS.

Life Membership was also unanimously granted to Sid Batchelor for his significant contribution to the promotion and advancement of cool growing Australian *Dendrobium* hybrids. This nomination was proposed by elder statesman and ANOS Patron, Wal Upton and seconded by Michael Harrison. Sid made and registered over 25 *Dendrobium* hybrids, many incorporating the now well-known 'Yondi' name. He utilised his *D.* Star of Gold 'Bathurst' with superb results. Arguably the best being his remake of *D.* Star of Riverdene (using *D. speciosum* subsp. *pedunculatum*). *D.* Star of Riverdene 'Amanda' HCC/ANOS won the Champion Hybrid at the 2nd ANOS Conference and another clone of Sid's breeding won the *Dendrobium* section at the prestigious Tokyo Dome show in Japan a few years ago. Sid also bred the outstanding *D.* Yondi Tina 'Goliath' AM/ANOS. Sid is also Patron of ANOS Sydney Group. Congratulations Sid.

David P. Banks



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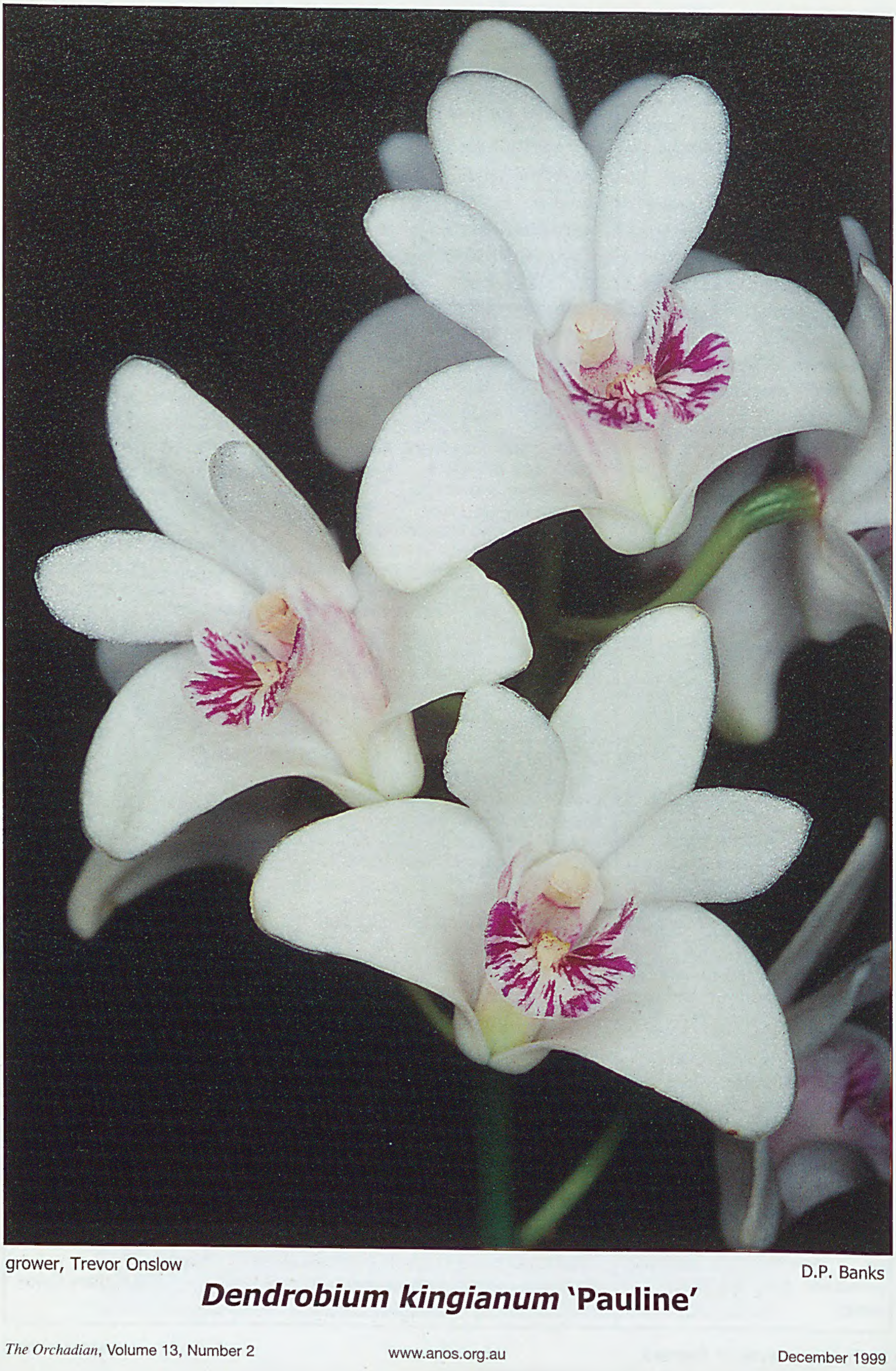

grower, Trevor Onslow

D.P. Banks

***Dendrobium kingianum* 'Pauline'**

Breeding Semi-alba forms of *Dendrobium kingianum*

Bill Morris,
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Adams and Lawson in their book on *Dendrobium kingianum* state on page 143 "the genetics for '*silcockii*' flowers appears to be complex". These flowers have been obtained unexpectedly from various crosses and selfings of coloured parents particularly where no whites or semialbas ('*silcockii*' types) are known in their ancestry. I would like to suggest an explanation for this behaviour, based on the assumption that the parent plants carry genes for white perianths as recessive genes.

The complexity arises because in the case of Ted Gregory's semialbas (*D. kingianum* 'Sue', 'Linda', 'Sophisticated Lady' etc.), the parent plant was triploid whereas in the case of the 'Big Foot' siblings the parents are diploid.

In Ted Gregory's line bred plants the semi-albas were produced by two generations of selfing. Writing the triploid plants from Gloucester, containing three sets of chromosomes as follows, I will outline the selfings.

Deep red (actually purple) plants, R R R (red breeding line plants).

Ted Gregory's original plant, red R R W

F1 triploids, pink R W W

F2 semi-albas (white perianth), white W W W

We know that perianth colour is inherited independently of lip (labellum) colour and all the above plants have coloured lips so these combinations refer to perianth colour only. W refers to a set of chromosomes that contain the genes responsible for producing a white perianth when no R set is present in the plant (i.e. W W W).

The basic assumption is that the original collected 'Gloucester Red' was R R W. Colour is dominant over white so white perianths will not appear while R genes are present. Triploids are normally sterile but may be fertile when their 3 sets of chromosomes split up in the gametes (sex cells), into diploid (2 sets) and haploid (1 set) gametes.

In this case the R R W parent produces the following combinations.

R R W = R R + W
or
R R W = R W + R

Theoretically these could combine to produce tetraploid (R R R W), triploid (R R R or R W W) or diploid (R W) plants. If this occurred one would expect these combinations to produce different coloured flowers e.g. R R R W (red), R R (red), R W W and R W (different pinks).

However, Ted Gregory reported that the first generation of selfed seedlings were all "typical" pink kingianums and Adams and Lawson state these plants "resemble each other very closely".

In other words it is unlikely that there was more than one type present. The breeding results from the deep "red" (actually purple) breeding program involving triploid x triploid crosses, produced triploids instead of the 3 possible ploidy levels. As the seedlings were "typical" pink kingianums it appears they were R W W rather than R R R (red to deep red). The second selfing (of one of these pinks) would produce gametes as follows:

R W W = R W + W
or
R W W = W W + R

The triploids from these gametes are R R W and W W W. Produced in roughly equal numbers these give 50% white perianths and 50% coloured (pink) perianths. As perianth colour and lip colour are inherited independently, these results refer to perianth colour only. All the plants have coloured lips so there are 50% semialbas ('*silcockii*' types) and 50% coloured flowers (perianth and lip).

These are the figures reported by Ted Gregory for the second generation of selfing.

In normal diploid plants, if the parent contains white genes (R W) then the first generation following selfing should give 25% white (W W). The fact that Ted Gregory got no whites in the first generation and 50% in the second generation was the cause of the complexity but is explainable as outlined above.

The production of semi-albas in the 'Big Foot' cross is more difficult and requires a different explanation, as the plants involved are diploids (see table of diploid plants listed by Adams).

Breeding for white flowers.

White flowers involving perianth, lip or both can be obtained from coloured flowers mainly in two ways. The first is via albinos and the second is by crossing coloured flowers of various hues (depending on what is available to start with) and selecting from each generation of offspring the palest flowers to become the parents of the next generation.

In the albino case, the white flower is a mutation and a coloured flower when selfed or crossed suddenly produces one or more totally white flowers.

In an albino the plant has lost the ability to produce the anthocyanin (red, blue or purple) pigment that is responsible for these colours in the parent. Other different pigments such as yellow (usually carotenoids) or green (chlorophyll) may still be present, as these are chemically different from the anthocyanins and are manufactured independently of the anthocyanins.

When an albino mutation occurs it does not turn a coloured flower into a white flower. In a diploid plant, i.e. a plant containing two sets of chromosomes (the usual situation), there are two sets of genes producing the anthocyanin pigment. A mutation to one gene in either set occurs but there is always the other unaltered set which goes on producing the colour pigments. Thus colour is dominant, however, often the dominance is only partial, not total, as the one set does not produce the same amount of pigment as the two sets would and thus, commonly, the flower is paler.

If the plant containing the recessive, white mutation is outcrossed to normal coloured flowers then the gene spreads through the population of plants as new seedlings mature but no white (albino) flowers appear until either selfing of one of the split plants (coloured/non-coloured) or crossing between two split plants occurs.

In these situations white flowers can occur because, on average, 25% of the seedlings get 2 mutated genes, one in each set of the anthocyanin producing genes and so no pigment is produced.

Thus in a population of plants there may commonly be albino genes present but they are not apparent until either a plant carrying them is selfed or, by chance, crossed with another plant also carrying the mutated gene.

In orchids, lip colour and perianth colour are inherited independently, which is why white flowers with coloured lips (and the reverse) may occur. However, with albinos, the whole plant, including the flower, cannot produce the anthocyanin pigment and both lip and perianth are white. In this case a single gene in a double dose controls absence of colour and in these situations the normal Mendelian ratios (25% white, 75% coloured) occur when selfing or back crossing occurs.

In the second type of white flowers the situation is different. Taking *D. kingianum* as the example, in most plants white areas occur in the perianth.

The "red" breeding program has, as one of its aims, the production of totally "red" flowers, which is the removal of all these white areas. The production of totally white flowers is the reverse of this, namely the removal of all traces of red pigment. In many plants the variation of amounts of colour in the flower is very large and apparently continuous. *D. kingianum* is a good example of this.

An examination of the photos in Adams and Lawson's book, although broken up into various colour categories, shows that all types of intermediates occur and no real breaks are apparent. In these circumstances it is usually stated that colour produced in the flower is controlled by many genes and not by a single gene, as in albinos. In these cases Mendelian rations do not occur. In the metabolic pathway leading to anthocyanin production there are numerous genes involved. Each gene is responsible for producing a protein (an enzyme), which controls each chemical step along the process leading to the final production of the coloured pigment.

It is plausible to interpret the whole spectrum of colour found in flowers, and in *D. kingianum* in our example, as due to differing efficiencies in this long line of enzymes leading to the coloured pigment. If most of the enzymes are efficient then a lot of colour is produced and if many of the enzymes are less efficient then little colour is produced.

Also, in the case of inefficient production of colour, it is reasonable to suggest that it takes time for small amounts of pigment to accumulate and this explains why some flowers may open white and slowly turn a pale or very pale pink or lavender.

A further factor is the distribution of colour in the flower itself. As mentioned earlier, there are areas of white in *kingianum* flowers. Most flowers have more colour on the outside of the segments than on the inside and also have deeper colour on the tips of the segments, becoming paler towards the centre. These distributions are also genetically controlled and may be due to a number of genes.

A possible relationship follows from the anthocyanin metabolic pathway. This series of chemical steps producing the coloured pigments can also produce other chemicals needed by the plant. The ones we need to consider are a group of chemicals called flavonols. These are chemicals that are produced in the early steps leading to anthocyanins, and they are needed in the development and functioning of the reproductive system of the flower. This is more important to the survival of the plant (as a species, not as an individual) than the flower colour itself so during the early stages of flower development the anthocyanin pathway is not producing anthocyanin pigment but is producing flavonols instead, as the reproductive organs are being formed.

This is the reason that the flower in its early bud stage is green and only begins to colour a short time before the flower opens, by which time all the sex organs, pollen, ovules etc. have been formed (although not yet to their final size).

It is interesting that the white areas in the *D. kingianum* flowers are usually centred around the base of the column, which one could suggest was due to the anthocyanin production not being initiated there, as flavonol production was still proceeding to supply the reproductive parts. As flowers become paler, due to inefficient enzymes or late conversion to anthocyanin production, perhaps this is itself partially due to concentration on flavonol production, pushing back in time the switch over to anthocyanin production.

It is interesting to look at the photos in Adams and Lawson's book, of the paler flowers (exclude "reds", whites and "silcockii's") and observe that in general paler flowers have darker lips. This may be a biased sample in that these plants may have appealed more to the collectors or growers.

However, it is also possible that a coloured lip is more important as the flower becomes paler, as the lip is the specific signal to the insect pollinators to alight and fertilise the flower. As the perianth becomes paler, to concentrate on flavonol production, it would be a selective advantage to keep the lip signal effective to try to compensate for the loss of signal (colour) in the perianth.

A further point should be made. Loss of colour only means loss of anthocyanin pigment. A white flower is not unpigmented; it is pigmented by white pigments, usually flavonols. Some flavonols may be "ivory" or pale yellow. Ivory is, I suspect, what has been called cream as in 'Cream 69'. I also suspect that the so-called "yellow" *kingianums* are coloured by flavonols rather than carotenoids.

It appears that both the "KWR 69" plants and the 'Big Foot' cross have produced white perianths by the second mechanism. They are not albino perianths producing normal Mendelian ratios.

The photo of 'Big Foot J McM', which is generally agreed to be a superior cultivar, shows clearly a ring of deep pink on the rear surface of the flower around the junction with the ovary. Others have been described as having traces or hints of pink in various parts of the flowers. Another was described by Adams and Lawson as "white with a small purple tip on the sepals and a pale mauve suffusion on the back of the sepals" and classed as "almost *silcockii*". Others have simply been called pale pink with a deep lip. All of these are thus not albino perianths but whites with traces of colour or pale pinks.

The same seems to apply to the KWR 69 plants. Many have traces of pink while others were pale pink. Some were "crystalline whites" but closer examination may disclose some pink. Interestingly 'Cream 69' selfed produced at least one plant, 'Nance Ganderton', which is an "almost *silcockii*" with a coloured lip but an off white perianth with "a hint of pale lavender on the reverse" again showing a relationship to the "Big Foot" plants.

The "Big Foot" Semi-albas and the "KWR 69" Whites.

In researching the background (parentage) of the "Big Foot" cross it was found that it was very similar to the "Cream 69" cross (KWR 69). This was not surprising as most plants involved were raised by Ken Russell (KWR).

The initial cross in both cases was a collected "red" *D. kingianum* from Gloucester Bucketts (New South Wales) crossed with *D. kingianum* 'White Lip'. This latter plant is a pale flower with a pure white lip. The pale flower suggests it probably has an inefficient pathway for anthocyanin production.

A particular seedling of this cross is involved in both the "Big Foot" and KWR 69 plants. The (B R x W L) seedling used for further crossing was a red plant with very even colouring. This plant was further crossed with two rather similar plants 'Lipstick' and 'Keith Preston'. Both these plants originally came from the same locality, close to Lanes Lookout near Dorrigo (NSW). Due to their similarity and their common locality they are probably quite similar genetically.

Therefore KWR 38 ('Big Red' x 'White Lip') x 'Lipstick', ('Big Foot Mother') and KWR 104 ('Keith Preston' x {'Big Red' x 'White Lip'}), ('Open Pink') are both very similar genetically. 'Open Pink' is an even pink flower. These two seedlings apparently carry less efficient colour genes.

Next a selected seedling from the KWR 38 cross was crossed with a different "red" Gloucester plant ('David Mitten Red No.1') by David Mitten. Adams and Lawson stated that this plant "does not transmit colour". I suggest that this is because it also contains a series of inefficient colour genes as the "Big Foot" plants were produced by this cross.

Either by chance or more likely by human selection, the pod parent contained recessive inefficient genes as did the "red" Gloucester plant it was crossed with. Rearrangement of the genes led to white (perianth) flowers appearing in the offspring.

In the KWR 69 ('Cream 69') cross the equivalent parent to 'Big Foot Mother' was called *D. kingianum* 'Open Pink'. This plant (however used as the pollen parent) was backcrossed onto the original ('Big Red' x 'White Lip'). In this last cross as well as recessive genes for a white perianth, there was also a recessive gene for a white lip. Thus as in the "Big Foot" cross, white perianths appeared, often with white lips, giving rise to totally white or cream flowers.

Thus the appearance of white perianths is simply due to genes for little colour, probably from the original 'White Lip' parent, being passed on through some of its progeny until, in the "Big Foot" example, it was crossed with another plant carrying similar recessive genes and then white perianth (and coloured lip) flowers appeared.

In the case of KWR 69, the same thing occurred except that in the final cross, the seedling carrying recessive genes was backcrossed to the original parent also carrying these genes. Again white flowers appeared but in this case white lips as well.

In both cases as multiple genes are involved there is a continuum of pale flowers from apparently pure white through to white with traces of colour to very pale pinks and pinks. In both lines ("Big Foot" and KWR 69) only fairly small numbers of plants were kept and raised to flowering and reddish seedlings were not observed, possibly due to this reason.

According to Ken Russell the KWR 69 cross produced around 70% white or cream flowers and that selfing of some of the plants e.g. 'Cream 69' x self or sibling crosses has produced higher percentages and whiter whites. This is simply due to the method of breeding outlined at the beginning of this discussion.

However even whites without any obvious trace of colour are still not albinos and crosses with other whites (albinos or other lines) may give unpredictable results.

The same applies to the "Big Foot" plants where David Mitten and Jack McMillan both quoted about 70% "*silcockii*" types from their seedlings. These figures certainly apply to the overall appearance of the flowers but the figure is much lower if minute traces of colour are considered (e.g. 'Big Foot J McM').

Summary

The complexity of the breeding behaviour of semi-alba ("*silcockii*" forms of *D. kingianum*) is due to two factors.

(a) the presence of triploid and diploid strains of this colour type

(b) the presence of true albino perianths in Ted Gregory's plants, which follow Mendelian ratios (complicated by their triploid nature) and the presence of non-albino perianths in 'Big Foot', 'Cream 69' and related crosses).

So for anyone wishing to breed "*silcockii*" (semi-alba flowers) it would be best to keep the two types of white perianth flowers separate and to breed within these lines. Ted Gregory's plants should be interbred and if, as described for 'Sue', breeding difficulties are encountered then crossing with or among other F2 siblings (whether "*silcockii*" or pink) should produce more good quality "*silcockii*" types.

The other non-albino types should be selfed or interbred and will produce more semi-albas (*silcockii*). However, they will continue to produce pale pink and pink perianth flowers.

If the two lines are crossed it is quite possible that all the offspring could be pink. It is also possible that some "*silcockii*" flowers could be obtained. However, the different ploidy levels may make intercrossing difficult.

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New ANOS website: www.anos.org.au

The Orchids of ? Creek

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It was 1989 when I found my first terrestrial orchid in situ and for me it was quite a find, simply because it was the first. However, in reality the species seen on that day was not the type to send the blood pulsing through the veins. It was a simple *Microtis unifolia*, if indeed any orchid can be called simple. I thought it was a good find even though not as spectacular as a large colony of *Glossodia major* or *Corybas pruinosus*.

I was told by my good friend Lex Barton, when I found an area which produced terrestrial orchids, I would need to visit it each month for two to three years if I wanted to see all orchids which may inhabit the site. This has proved to be correct due mostly to seasonal factors and also because a power line easement cuts a wide path through it with the occasional slashing taking place.

At this juncture I will point out the reason I have not given this area a name. It is because it is known to many and easily accessible. When I mention I have seen 15 genera and 29 species within its boundaries, most people are surprised. It is the site of several firsts for me, with 17 of the species being first time finds and thus I regard it as special. Only two of the species are epiphytic.

In truth, the site is not pristine but what is left suffers from recent nearby subdivision with trail bikes and mountain bikes damaging the narrow tracks and any orchids which dare to grow along their edges.

This year so far has been excellent for terrestrials with steady summer and autumn rain and the number of orchids evident is in keeping with a good season.

In chronological order, the species seen are; February to April, *Pterostylis parviflora*, *P. obtusa*, *P. hispidula*, *Eriochilus autumnalis* and the last of the group is the tiny *Acianthus exsertus*.

May brings the species with built-in character, *Corybas aconitiflorus* and *Corybas pruinosus*. An uncharitable cymbidium grower once referred to a pot of *Corybas* as being like a pot full of snails. Guess who now grows this genus? June follows with three species. The tall multi-flowered *Pterostylis longifolia*, the attractive *Caladenia catenata* and the humped over flowers of *Acianthus fornicatus*. *Caladenia catenata* is one of the easiest orchids to see and one, which unlike some of the smaller multi-flowered terrestrials always makes a good photographic subject.

Two species only for July and August but what is lacking in variety is not missing when a flower count is done. *Pterostylis nutans* are widespread through the area and the flowering time is actually spread over several months. Meanwhile the classic shaped *Glossodia major* can in good years form a blue carpet with hundreds of plants spread along the creek and under the power lines. In my opinion, it is from this time on this small pocket of nature exhibits its best orchids and perhaps its greatest diversity of species and genera.

September and October arrive with warmer weather and more blue flowers in the form of *Thelymitra pauciflora* and *T. ixioides*. These are in company with the small salmon pink *T. carnea* and another pink *Thelymitra* but in a pale watercolour shade, *T. rubra*. Only one plant each of these pink species has been found.

Unfortunately, Integral Energy does not burn underneath its lines to clear the ever-growing scrub, as a fire would certainly benefit all of these terrestrials. Next to flower is the widely variable *Caladenia carnea* in all colours from white to a rich pink.

To find an alba form of any species is considered a coup of some degree but as *Caladenia catenata* already comes in white one must look for something else and voila there it was, a beautiful pink *C. catenata*.

Only one, but an excellent specimen at 35mm across. Back to reality and from the sunlight into the shade to find *Chiloglottis formicifera.* This colony is in the shade on the southern side of a small thicket of myrtles, the ground never completely drying out. Typical *C. formicifera* with a diamond shaped labellum lightly spread with dark calli resembling blackberry jam or caviar, depending on ones taste or gastronomic preference.

Returning once more to *Pterostylis* we find there are two more species. The chunky *P. curta* and the slender *P. pedunculata.* While these are enjoying a little shade, back out under the powerlines again *Caladenia testacea* is flowering. With off white or pale greenish yellow petals with tips of light brown, this species is said to have one-two flowers but plants with as many as five are not uncommon. This is another species that will benefit from a fire. Does anyone out there have a good relationship with Integral Energy?

For several years after I saw my first bearded orchid at this site, (*Calochilus robertsonii*), it remained the only species in the genus I had seen around the creek, until last year when numerous plants of *C. paludosus* appeared. It can only have been age that caused me to overlook them, as they were in a conspicuous position, or perhaps it was the deluge in late winter after which many species appeared almost overnight. However, it is amazing what can be found by actually getting out of the car and walking around.

One species, which falls in to the easy to see category, is *Diuris sulphurea.* My first sighting was here and at the time to say I was pleased would be an understatement. There are some orchid growers I know who have seen so many clones of a certain species, they express a casual indifference at the sight yet another of a particular species which may occur frequently. When that day comes for me, I will provide the nails so the lid can be permanently fixed.

Two more terrestrials and one epiphyte to go before the hot weather arrives.

The first is *Lyperanthus suaveolens* with its single leaf, ribbed on the inside but smooth on the outside. The petals and sepals are caudae-like and usually brown with darker red-brown tips. *Microtis unifolia* is an orchid that does not excite many because the flowers are very small, green and only becomes an impressive sight when in a large colony. The epiphyte is the "dagger orchid" *Dockrillia pugioniformis* (previously *Dendrobium pugioniforme*) and I have only seen one plant *in situ.* It is no longer there and I would prefer to think it was washed off its host (rock) in a flood rather than collected, for I have not seen another clone in recent years.

Now almost at years end and just two species remaining, one terrestrial and one epiphyte. The terrestrial is *Orthoceras strictum,* commonly known as the horned orchid. The form here is green but the black form is only a few kilometres away. The few plants in this area are in the driest habitat of any *Orthoceras* I have seen but still flower well with eight or more flowers.

Last but certainly not least is *Sarcochilus hillii.* Attaching itself to the many small myrtle trees which inhabit the creek bank it is a summer delight. Slender jungle-green/reddish leaves and delicate pale pink flowers with a beautiful crystalline surface, with the root system capable of travelling almost a metre in search of food.

Without doubt there are more species to be found at ? Creek and I am sure they will include a *Genoplesium* or two and probably at least one more *Thelymitra.*

One genus unseen so far is *Cryptostylis.* This surprises me as I have seen it in most areas I have walked around Nowra and as an evergreen it is easily visible. But then again, "never say never".

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The Watagan Mountains

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Situated about 40 kilometres west of Newcastle, the Watagan Mountains (New South Wales) comprises the Watagan State Forest, Wyong State Forest, Olney State Forest, Heaton State Forest and Corrabare State Forest and arguably the Pokolbin State Forest, which is part of the Broken Back Range, situated West of Cessnock. This region is a portion of the main ridge that runs down from the Blue Mountains to the west and reaches the sea at the inner Newcastle suburb of Merewether. This is one of the very few places that the Great Dividing Range actually reaches the ocean.

Composed almost completely of Hawkesbury and Narrabeen sandstone with an elevation of between 500 to 600 metres and the highest point being Mount Warrawolong at 643 metres which has a capping of basalt rock, a left over from the ancient lava flows that formed these rich range forests. This is also the highest point East of the Blue Mountains. The Watagan forests are bordered by the Hawkesbury Mountains to the South, Yenco National Park to the West, and the Hunter Valley to the North.

With an annual rainfall of between 1700mm to 2500mm on the eastern side and a rapid reduction on the western slopes which receive about 1000mm or less. This high rainfall especially on the eastern side support extensive rainforests and help create gorges to well over 300 metres deep. This gives rise to a diverse and wonderful range of flora and fauna, while on the western slopes the gullies are much drier and longer but still have high ridges and cliffs where the vegetation is more of the open forest or dry sclerophyll bush but much flora and fauna is still evident.

While the flora is very diverse it includes a large number of orchid species, both epiphytic and terrestrial. The majority of the terrestrials are abundant with *Acianthus fornicatus* and *Caladenia catenata* along with several *Pterostylis* perhaps the most common. *Diuris, Caleana, Calochilus, Chiloglottis, Corybas, Cryptostylis, Dipodium, Eriochilus, Erythrorchis, Glossodia, Lyperanthus, Microtis, Prasophyllum, Spiranthes, Thelymitra* and *Calanthe* are all represented in various degree of abundance while the epiphytes are well represented by *Liparis, Dendrobium, Dockrillia, Papillilabium, Sarcochilus, Cymbidium, Bulbophylum* and *Plectorrhiza.* Of the epiphytes, Liparis *reflexa* and *Dockrillia striolata* are very abundant and found all over the areas of both the eastern slopes as well as the western side. But in my opinion the most beautiful sight in this sub tropical paradise would be the sight and perfume of the famous "rock orchid" *Dendrobium speciosum* which can be found over the entire area both eastern and western sides.

Having spent much time wandering the "Watagans", one of my favourite places is the high bluffs of the northern end of the Broken Back ranges overlooking the Hunter Valley. While gazing across the valley floor to the high mountains of the Chichester and Barrington areas I often wonder what it is about this area that has such an effect on the migration of many of our epiphytic orchids.

After having travelled thousands of kilometres all the way from Tasmania, *Dockrillia striolata* comes to a sudden stop in the Watagans and although very prolific right up to the southern edge of the Hunter Valley, I know of no area on the Northern side that this orchid can be found. Another orchid that is very common in the Watagan and travels all the way from Victoria is *Dendrobium speciosum* and although small colonies can be found at Bulahdelah, and some small areas of the upper Hunter River this orchid finds the Hunter Valley to big a hurdle to cross in any number. From the Northern side an orchid we all love - *Dendrobium kingianum* after travelling down from Queensland does not come any further south than Bulahdelah and Gloucester on the northern edge of the Hunter Valley with the same to be said of *Rhinerrhiza divitiflora* (although it has been claimed to have been found further south I have never seen it in the Watagans). *Dendrobium tarberi* (*Dendrobium speciosum* subsp. *hillii*) is another that finds the Valley to big a hurdle to cross although there is an area on the northern edge of the Watagan mountains where there are intermediates between *Dendrobium speciosum* and *Dendrobium tarberi* and there is (was?) a small colony of *Dendrobium tarberi* much further south – near Peats Ridge. Other orchids to reach the valley floor but come no further south are *Cymbidium canaliculatum* and *Dendrobium falcorostrum.*

Although the Hunter valley is wide it is easy to see from one side to the other, I know that most plant species should have little difficulty crossing that small distance. The climate is very similar on both sides and although the northern side has higher mountains the difference is not enough to be a barrier. Perhaps a logical reason is that the mycorrhiza of certain species has adapted to some particular type of rock as host but this does not explain the epiphytes such as *Dendrobium tarberi* that are mainly epiphytes and not often in these southern limits found as a lithophyte.

I feel that the answer lies in the fact that the southern side of the valley is composed almost completely of Hawkesbury and Narrabeen sandstone with a small amount of basalt on Mount Warrawolong. While the northern side is composed almost entirely of basalt but here again is another mystery, why should there be two entirely different rock formations on either side of the valley as the Watagans are the furthest north that Hawkesbury sandstone is found?

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CD-Rom Review

Litbul 7 – Orchid Species Database

by Rudolf Jenny
CD-Rom US$450.00
Available from Rudolf Jenny,
Moosweg 9, 3112 Allmendingen Switzerland.
E-mail: RJenny@compuserve.com

Litbul 7 – Rudolf Jenny's Orchid Species Database was released on CD-Rom just after the World Orchid Conference in Vancouver, Canada. It provides data on almost all major published works on orchid species – providing details of when and where they were named and by whom. It also provides details on all published works on an author-by-author basis.

Subscribers will be sent the next renewal (Version 8) early in 2000. Subscribers have direct access to Rudolf's extensive private library, one of the most comprehensive in the world. Every single entry is available as hard copy from his library, so if you are looking for something you have found in the database, Rudolf can deliver it promptly by fax or mail.

Frustratingly, it does not use the Windows™ system. You move about the program mostly by using the F keys at the top of traditional keyboards. It is a bit annoying at first, but you tend to get used to it. There is also help on using the system available on the CD. (I found it easier to print this out and have it handy when working *Litbul*).

I recommend this CD-Rom to serious students of orchid species plus anyone involved in significant writing, editing and publishing. I feel it is a necessity for those involved in orchid taxonomy, systematics and nomenclature. Yes, at US$450.00 it is expensive – but I am happy I didn't have to sit down for those hundreds (thousands?) of hours inputting the data!

David P. Banks

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CD-Rom Review

Orchidopaedia Volume 1: Genera

by Greg Steenbeeke and Gary Yong Gee

CD-Rom AUD$80.00
Available from Orkology Kreations,
40 Alice Street, Grafton, NSW 2460.
E-mail: orkology@key.net.au
Websites: www.key.net.au/~orkology
www.powerup.com.au/~nepean/

In October 1997 I had the good fortune to accompany Greg Steenbeeke on a three-day journey of his beloved Kowmung River in the Kanangra Boyd Range. During this time, he raised the idea of creating a resource that completely covers the Orchid family. My first thoughts were "good luck" as my mind boggled at the sheer enormity of recording the largest family of flowering plants. Well here I sit two years later preparing the promised review of the first volume of his *magnum opus*. Wisely, he has undertaken the task in stages with his first volume covering all the 1600 plus natural and man-made genera of the family *Orchidaceae*. Also, wisely, he has sought the partnership of Gary Yong Gee, a noted orchid photographer with excellent knowledge of his chosen subject.

The *Orchidopaedia* is available only as a CD ROM. Over 500 photographs of examples of most genera accompany the text. Later volumes promise to cover the species.

There is no comprehensive manual explaining how to install and use The *Orchidopaedia* but this is not necessary. Installation is a matter of opening the CD ROM drive, placing the CD in it and closing it. The CD ROM cover does include instructions, which mainly apply to computer systems running Microsoft Windows 95, 98 or NT). The system requirements shown on the back cover require the use of at least a 486-based computer with a CD ROM drive and a Javascript capable Web page browser.

You do not have to be connected to the Internet to use the disk. Ideally, you should be running Internet Explorer version 4 or later. I could run it on Netscape Navigator successfully but many of the pictures were not viewable. You can also run it on a Macintosh but you will need to open your browser and use the File menu the Open File to navigate to the start up page "Go.htm"

Once you open the actual *Orchidopaedia*, it will automatically open up three browser windows and may then prompt you to close another. Just click on "Yes" to do this. The window you will first see is the Main Window that includes the Glossary, References and Help. Check the Help page for basic information about navigating through the different areas.

The other two-browser windows contain the Genera Information and Thumbnail Catalogues. The Genus window outlines the history, distribution, etymology, type species (if any), similar and related genera, distinguishing characteristics, taxonomic references and, where possible, photographs of examples of each of the natural genera.

In the case of intergeneric hybrids, the formula is given. The Genus window is broken into two frames. If you click one of the initial letters in the index at the top, the left hand frame shows the list of genera in alphabetical order as well as synonyms and abbreviations. Photographs are also included for most genera.

Each member of the list is linked and will open up the genus information in the right hand window. All this information is linked to the Glossary and Reference list but when you click on one of these links you will need to manually switch to the window to view it using either Alt -Tab or the mouse. Also included with the relevant genus is a linked list of named intergeneric hybrids.

The taxonomic descriptions include both the Dressler (1993) and Szlachetko (1995) systems of classification, as they are the most up to date systems. Mention of the Schlechter system should have been included as most enthusiasts are familiar with this.

The authors have also endeavoured to make their work as up to date as possible and have already included some of the newly recognised genera that were formerly given sectional status, such as *Grastidium* Blume However, these are generally listed as synonyms rather than given separate treatment (ie *Grastidium* is linked to *Dendrobium* Swartz). *Dockrillia* Brieger is treated separately to *Dendrobium* although its synonymy with *Dendrobium* is acknowledged.

The third window has the Thumbnail catalogues, thumbnail meaning the smaller "thumbnail" size versions of the photographs used in the *Orchidopaedia*. These thumbnails are also used in the genus list of the Genera information window. This window possibly gives the *Orchidopaedia* its greatest potential as a research tool. There are three options: Form and Habit, Relationships, Region.

The first option sorts the genera into epiphytes or geophytes, which are then further broken down into their growth forms. Illustrations show what each of the growth forms look like but definitions also appear in the glossary. Clicking on any of the links list the thumbnails with generic names. Each are linked to the Genera Information window but you must manually switch to this window to view it.

The second option sorts the genera using either the Dressler or Szlachetko classification to be able to view taxonomical relationships (ie subfamily, tribe and subtribe).

The third option is ingenious: you are able to view all the genera from a selected continent. So the Australasian section contains genera from Australia, PNG, New Zealand and Oceanic nations.

Once you get used to navigating your way around and through the three windows, you get an appreciation for the depth and quantity of work involved.

It would be easy to pinpoint minor errors and bugs in the interface but I have chosen not to do this so as not to detract from the value of the *Orchidopaedia* as a reference. The asking price of $80 is not unreasonable when you consider that there are over 1000 pages of information.

I thought there was a major omission when I could not find any reference to the sub-tribe *Sarcanthinae* in the *Orchidopaedia*. Neither systems of classification include this sub-tribe. Also there are 154 genera not accounted for in the Szlachetko classification.

Although I did not review all of the 1600 genera included, the only error I found is the misspelling of *Winika* (the new generic classification for the species previously known as *Dendrobium cunninghamii*.

The only Web based resource that I could find that approaches this work in scope is that of Jay Pfahl's Internet Orchid Species Photo Encyclopedia (www.orchidspecies.com) which, although an excellent resource I found contained a large number of errors.

Once complete, I am sure the *Orchidopaedia* will deserve status as a seminal reference source in orchidology. However, I thoroughly recommend Volume 1 to you as the most comprehensive and up to date catalogue of orchid genera available.

For a preview of the authors, work, you will be able to see a sample in one its earlier versions at the web site: http://www.key.net.au/~orkology/Orkology/botsoft/index.html

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Orchid Slabs – Vertical or Horizontal?

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Whilst many of our native orchids grow best in pots, a large majority of the so-called "botanical" species, including most *Sarcanthinae* and *Bulbophyllum* are best treated as slab plants.

There are numerous slab materials available, but most growers prefer either natural cork bark or treefern fibre, depending on the species being grown and the cultural techniques of the grower.

Most *Bulbophyllum* species are grown on treefern fibre slabs, because treefern is water retentive and the orchid roots are able to penetrate into the fibre where they stay cool and damp.

In recent years I have introduced a couple of extra steps into my method of dealing with these orchids, and I think they have proven successful.

When I tie a new orchid onto a piece of treefern fibre, I first decide just where the plant will sit on the fibre and then I lay a few strands of epiphytic moss on that spot. The root mass is then positioned directly over the moss and the plant is tied firmly in place with fishing line. Extra strands of moss can be tied over the root pad as well if this is considered necessary (i.e. if the species is ultra moisture-loving). Be wary of using too much moss - the object is to create an area of extra dampness, not a permanent lake. The new roots should quickly grow through the moss and into the treefern fibre. As I mentioned, epiphytic moss is best, but sphagnum moss is also acceptable.

The next thing I do is place the newly mounted plant on a normal horizontal bench rather than hang it directly on a vertical frame. This ensures the treefern fibre doesn't dry out too quickly as it would if it was hanging up. Depending on the time of the year and prevailing weather conditions I leave these orchids for six months or so before placing them on vertical frames. By this time they have established their new roots and they are away.

However, with some species I have learnt that they will do better if they are left permanently in a horizontal position. Some of the highland *Bulbophyllum* species from north Queensland require constant moisture and will not tolerate dryness for any length of time. Such orchids as *Bulbophyllum lilianae, B. evasum, B. newportii* and *B. lageniforme* and the like are best treated this way.

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Helene Wild – Botanical Artist

A reproduction of an original watercolour by award winning botanical artist, Helene Wild graces the back cover of this issue. Keeping with the "sun orchid" theme, *Thelymitra ixioides* is depicted. A number of her works have appeared over the past few years in *The Orchadian*, within the series "Australian Orchids Illustrated". Helene also edits the ANOS Victoria Groups monthly journal (it is more than a newsletter), which is the finest of its type in Australia.

Recently Helene started her own website which displays many examples of her work...some of which is for sale. Apart from prints, there are cards, coffee mugs and decorative plates.

Have a look at: or write to Helene at:
56 Civic Parade, Seaholme Victoria 3018. Phone/fax (03) 9398-2617.

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Self Pollinated Sun Orchids of the *Thelymitra pauciflora - T. longifolia* Alliance in Australia

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The first *Thelymitra* to be named was the New Zealand *Thelymitra longifolia* described by Forster and Forster, the German father and son botanists who visited New Zealand with Captain Cook in 1773. As such it was also the first New Zealand orchid to be named.

In 1811 Robert Brown named the Australian species *Thelymitra nuda and T. pauciflora.* Both these two species and *T. longifolia* have very similar flower and column structure, i.e. regular flowers with blue or white petals and a simple tubular column with a tuft of white hairs.

Since that time over 20 species with this basic pattern have been named, some with large, readily opening, insect-pollinated flowers and others with varying degrees of self-pollination.

At times botanists have tended to lump all or most of these together under the one name *Thelymitra longifolia* but this is not appropriate as they are distinct, genetically separate biological entities, despite their similarities.

Some of these species have only recently been named i.e. the pink tufted *T. malvina*; *in* fact there are many other species not yet described or even collected. There are almost as many species in the complex as there are available habitats; from rainforest and swamp to desert fringes, from the littoral zone to the Alps. There are actually as many species in this single complex as all other sun orchids put together.

The *Journal of the New Zealand Native Orchid Society* has over the years carried articles discussing a range of un-named self -pollinated species in the complex, giving names such as *Thelymitra* "Ahipara" and T. "Darkie" and discussing whether the true *Thelymitra nuda and T. pauciflora* of Australia even occur in New Zealand.

There has however been little written on the group in Australia. Local or state orchid books treat them differently. In Western Australia names like *Thelymitra graminea, T. granitora, T.* sp. aff. *holmesii, T. macrophylla and T.* sp. aff. *macrophylla* are used and most people would be hard put to separate these from the Eastern states species which have names like *Thelymitra nuda, T. fragrantissima, T. megcalyptra, T. holmesii and T.* sp. aff. *nuda* "Basalt Plains" as well as *Thelymitra pauciflora.*

The late J. Z. (Joe) Weber (botanist at Adelaide) worked on this complex of sun-orchids for many years and at the end still held the belief that the name *Thelymitra longifolia* should apply to the whole group but he worked mostly from preserved material which could not be expected to provide a very clear picture! He did recognise separate entities but did not like the concept of naming them as species.

Three questions must be asked before we should bother accepting the various biological entities as valid species or subspecies, namely

1: are they constant throughout their range, favouring a particular habitat over a discrete geographical area?
2: are they true breeding?
3: are there ways of telling them apart morphologically?

Many of the species have huge ranges from one side of Australia to the other and are so constant that it is not even possible to determine if an unlabelled collection came from near Adelaide or from Tasmania, and those that I treat here all have specific habitats and are self perpetuating, rarely hybridising with other members of the complex except in disturbed sites.

Some of the best diagnostic features include: leaves - width and cross-section i.e. broad, flat, many ribbed, channelled in V or U outline, glaucous, green or reddish; stem bracts - number and size; length and ribbing of ovary; flowers - many or few, petals rounded or acute, thin textured or not; column - colouring, top inflated or not, notch broad or narrow, curved, scalloped or smooth, with or without teeth;

presence or absence of hair-tufts, and the colour, texture, thickness, angle and size of these hair-tufts.

Once an observer is used to seeing these features it becomes easy to separate most of the taxa involved.

I am going to consider the self-pollinated species only and treat them one by one:

Thelymitra pauciflora

In the narrow sense this species has a slender, slightly channelled leaf, small bracts, few, small flowers in pale-blue or white, narrow pale column with yellow, neatly- notched hood and small, white, curly but not dense hair-tufts held in front. (See Fig 1 left) Also see *Orchids of South Australia* - plates 220-221.

This is basically a woodland species which flowers early, but it also has forms which occur in swamps, heath-and and sub-alpine habitats, which may prove to be separate sub-species. It occurs in all states and New Zealand in the sense used here.

Thelymitra malvina

From the first named to one of the newest species. *T. malvina* is easily recognised by its long, thick, deeply channelled leaf with its brown base, many flowers, shiny blue tepals, tall, pale bluish column, the yellow column hood projected forward in a tube, the hair-tufts thrust well forward, a distinctive mauve.

When first named it was thought to have a limited distribution but it actually occurs from South-east Queensland around the coast to New South Wales, Victoria and the far South-east of South Australia, in Tasmania and in New Zealand, usually in leached, damp sands in heathland and forest or woodland with a heathy understorey. (See *The Orchids of Victoria* page 347 for a superb illustration)

Thelymitra holmesii

This name at present covers a number of species that share the features of deep -blue flowers having a column with a bright yellow expanded top with a black band below the summit and incurved margins to the notch.

True *T. holmesii* has a leathery, deeply V channelled leaf, slate-grey buds, deeply coloured flowers, pinkish column, fleshy incurved margins to the column cleft, sparse wiry cream coloured hair-tufts much upswept usually with some smaller yellow or red hairs at the base.

It flowers later than most other members of the complex in the same area, mostly November and December. (See *Orchids of South Australia* plate 209 and *The Orchids of Victoria* page 340 for two species in the complex.)

It occurs in seasonally inundated depressions or swamp margins in a variety of soils. This taxon is sometimes semi-aquatic in water to one metre deep in winter and actually flowering in water to 30cm deep. It is widespread from southern NSW, Victoria, Tasmania and South Australia, mostly coastal. Plants from dry country in woodland or plants in Western Australia represent undescribed species.

Thelymitra mucida

This species is similar to *T. holmesii* and open flowers are needed to tell the difference as leaves and buds are the same. The big difference lies in the waxy bloom found on the column hood of *T. mucida* (the name "mucida" means mould and refers to this bloom. There are two different subspecies; the type form from swamps has a narrow column hood and colourful hair-tufts.

It is very widespread, occurring in Western Australia and the Eastern states from Kangaroo Island (S.A.) to Wilsons Promontory (Vic.) (see page 262 of *Orchids of South-west Australia*). Another form from the eastern states grows in woodland and has a broad top to the column and less colourful hair-tufts (see **Fig 2**).

Thelymitra graminea

There seems to be two taxa going by this name; one is a species confined to granite outcrops in the far South-west of Western Australia which is unusual for two reasons: Firstly, it flowers only after fires and secondly, it forms large colonies by vegetative increase; the other occurs as single plants in forest in the same areas and bloom without fire.

T. graminea can be recognised by its very acute tepals and straight column, the top not curved forward like in *T. pauciflora* and the smaller hair-tufts. For an illustration see *Orchids of South-west Australia* page 265.

Thelymitra granitora

This Western Australian species shares the features of thin-textured, pale flowers and large, falcate, leathery leaves with *T. longifolia* in New Zealand. It is distinguished from other Australian species by these features, the habit of forming large dense clumps and by the white column. (See *Orchids of South-west Australia* page 264.)

Thelymitra sp. "Pepper Top" (Fig 3)

This is a very widespread species in the Eastern States (and Tasmania) to as far west as Adelaide. It occurs in poor soils, which are often waterlogged in winter, growing in heath and rough scrub. It can be recognised by its short, broad, ribbed leaf which is suffused with red, flowers which are often more mauve than blue, short and rounded sepals, the column top in tones of red or brown the cleft a deep, narrow often ragged tear rather than a neat V shape, the hair-tufts small and held against the top of the column.

Under the microscope the hair structure is quite different and like many other species it can be recognised from this feature alone! It starts flowering soon after *T. pauciflora* in the same area so that the two are often found together with occasional hybrids.

Thelymitra sp. "Blue Column" (Fig 4)

This species is very restricted, occurring only in damp, leached sands under *Leptospermum* (tea-tree) scrubs in Tasmania and the Mount Lofty Ranges in South Australia. It is one of the smallest members of the complex, the leaf is very narrow and not channelled, the flowers tiny and few, the most distinctive feature being the wholly blue column; the hair tufts are small and dense.

It flowers in November and the flowers are short-lived. Like most of the other species in the complex it often crosses with sun orchids of other complexes such as the pink *T. rubra* or the spotted *T. ixioides.*

Thelymitra sp. "*bracteata*" (Fig 5)

In contrast to the previous species this one is very widespread, reaches up to a metre tall and grows in rich soils in forest. It is most easily recognised from the large often many-ribbed, leathery leaves, the large curved stem bracts and bracts subtending the flowers. On healthy specimens there may be as many as 20 flowers, these are on very long, strongly ribbed ovaries, green outside the sepals, pale-blue inside, the column is similar to *T. pauciflora* but long and slender.

Occurs throughout the Eastern states being more common in the south in open forest, in the mountains.

Thelymitra sp. "Darkie" (Fig 6)

This is another robust species, occurring in rich soils in grassy areas in eastern Victoria and Tasmania but probably more widespread. It is now rare due to loss of habitat. The leaf is large and leathery, U shaped in cross-section, brown tinted, the stem thick with many, small, deep blue flowers which rarely open, sepals are brown outside, column large, white and tilted back, the hood not inflated but truncated with a black band below the yellow top. This is one of the most robust species in the complex reaching one metre in height.

Thelymitra sp. "Hairless"

This taxon is restricted to dry mountain ranges i.e. the Flinders Ranges in South Australia and Cocoparra in New South Wales.

It has a short reddish, leathery leaf, rounded petals, an olive-green top to the column and few or no cilia on the column arms. It is not the only form in the complex to lack hairs but it is the only widespread one. It does not go as far into the outback as some of the forms of *T. megcalyptra* but that species does not self-pollinate.

Thelymitra sp. aff. *holmesii* "Inland"

(**Fig 1**, right)

This is another dryland species, apparently very rare due to clearance of its rich soil grassland and open woodland habitat. It has a short strap-like leaf, and few flowers, of the colour, shape and size of *T. holmesii* but the very different swampy habitat of that species and its deeply channelled leaf as well as the sparse upswept hair-tufts clearly separate the two. The inland *T.* sp. aff. *holmesii* which occurs from the Mount Lofty Ranges across northern Victoria to grassland near Canberra (ACT) and the New England Tableland (NSW) also has a much earlier flowering time (August to October)

Summary

The *Thelymitra pauciflora* complex is difficult to work with as the flowers only open in warm, sunny weather and as most grow in cool, high rainfall areas there are few days suitable for opening during the short flowering season. This problem is compounded by the presence of local forms, by hybrids with species outside the complex and through loss of the specialised habitats required by some. There may be as many as twenty different self-pollinated species in this complex.

As they are self-pollinated some species quickly colonise pine plantations and roadsides.

There are very similar taxa throughout South-East Asia, New Guinea and Oceania although the genus is considered to have evolved in Australia and the fine seed of these self-pollinated taxa to have blown overseas.

Most of the species hybridise with other sun-orchids from different sections of the genus; i.e. the pink flowered *T. rubra* and *T. luteocilium,* the yellow *T. antennifera* and the purple spotted *T. ixioides* and *T. juncifolia* as well as *T. nuda.* (See **Fig 7** for a hybrid between *Thelymitra* sp. "Blue Column" and *T. juncifolia.*). **Fig 8** shows an undescribed *Thelymitra* species from Tasmania.

There is still much work to be done to sort out the rarer species, but those mentioned above are well enough understood to be formally described in a forthcoming paper.

Acknowledgements

This work is partly funded by an AOF (Australian Orchid Foundation) grant. I would like to thank the many orchid enthusiasts who have corresponded with me on the genus *Thelymitra.*

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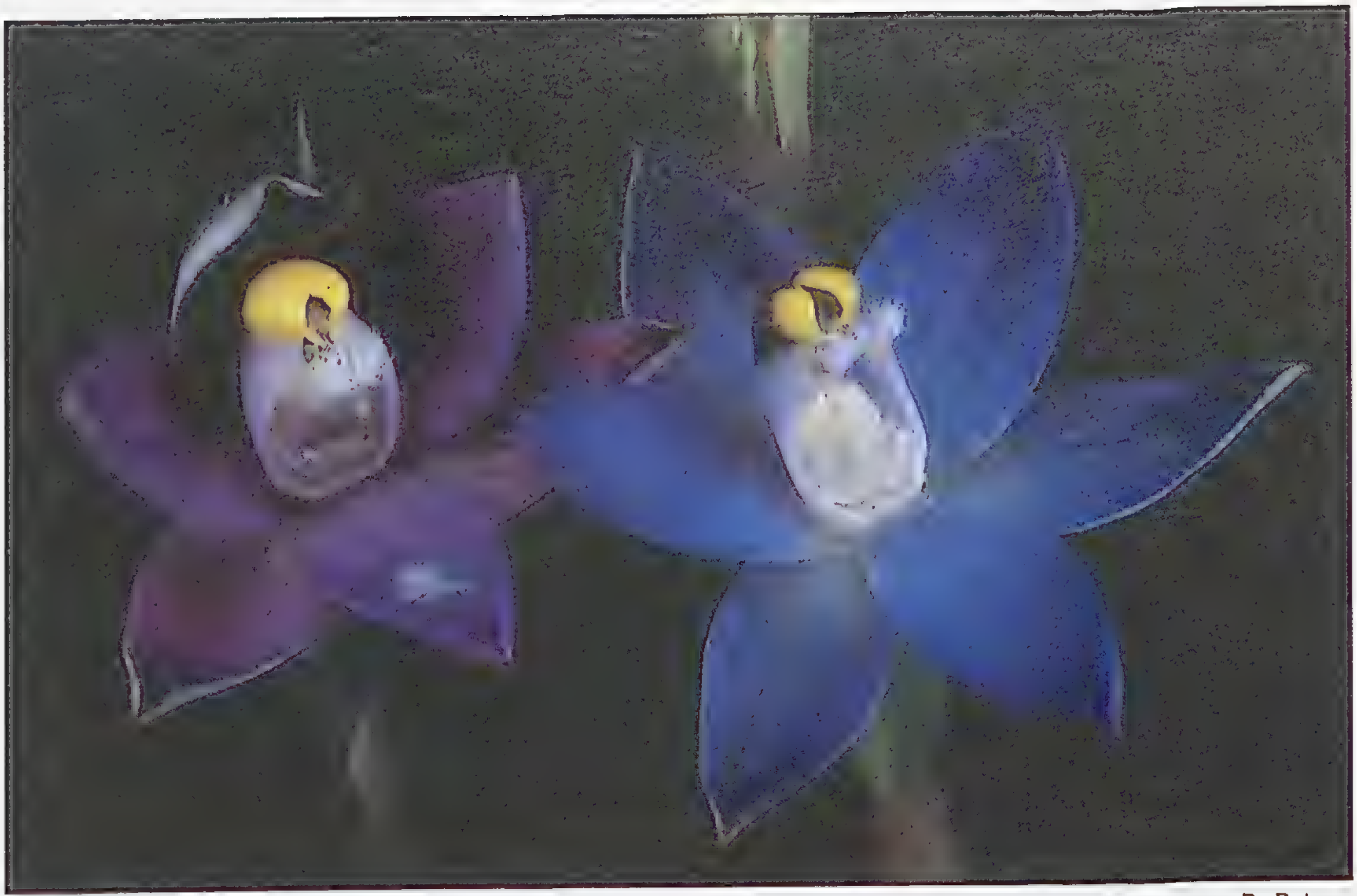


Fig. 1 R. Bates

Thelymitra pauciflora (left) from New South Wales.

Thelymitra* sp. aff. *holmesii (right) (dry woodland) from New South Wales.

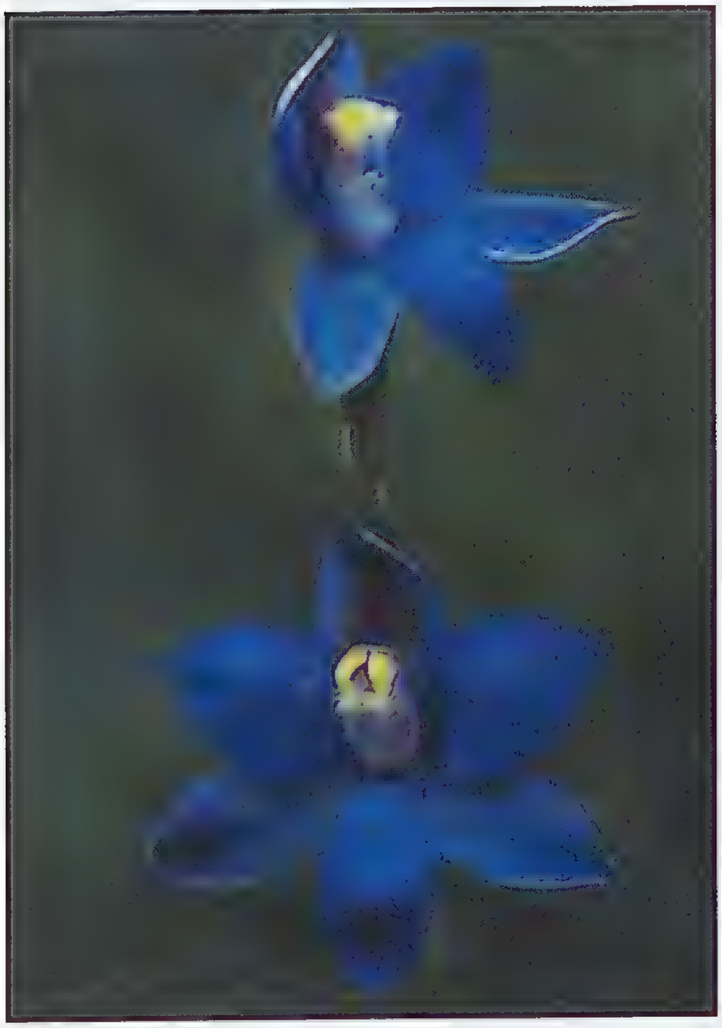


Fig. 2 R. Bates

Thelymitra mucida
from Adelaide Hills, South Australia.

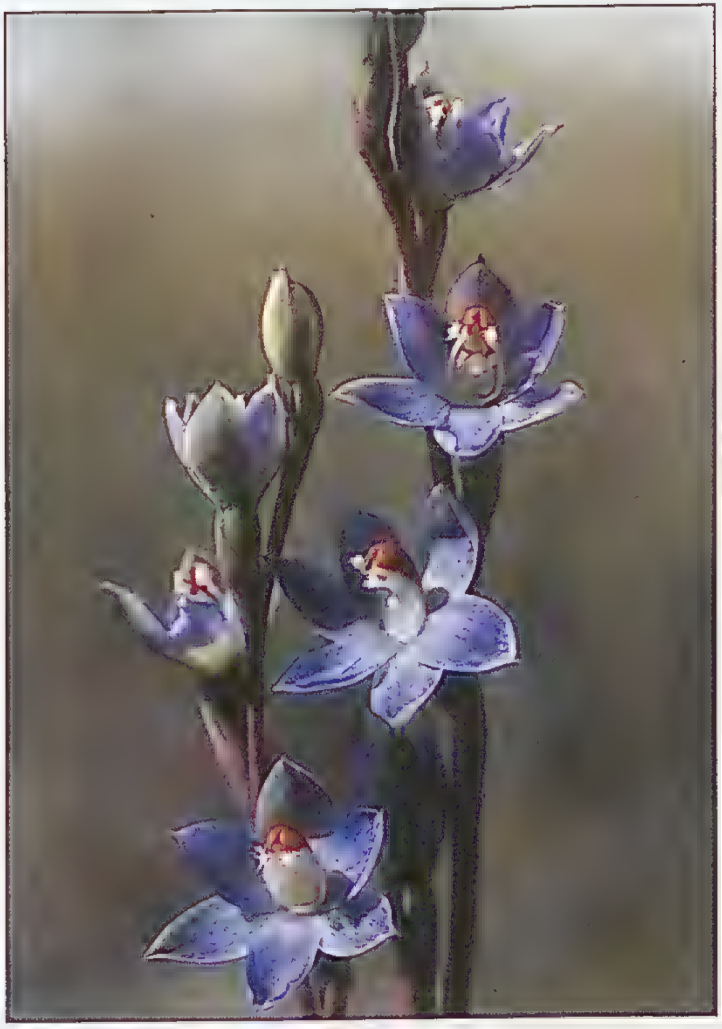


Fig. 3 R. Bates

Thelymitra* sp. aff. *pauciflora
"Pepper Top" from Tasmania.

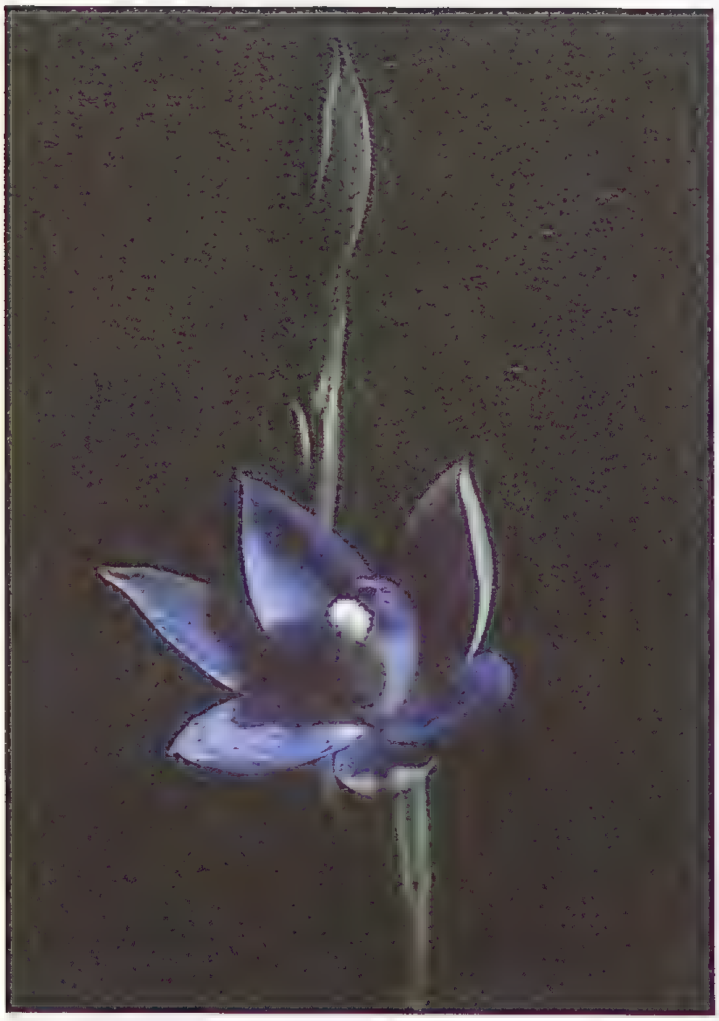


Fig. 4 R. Bates

Thelymitra* sp. aff. *pauciflora
"Blue Column" from Adelaide Hills, S.A.

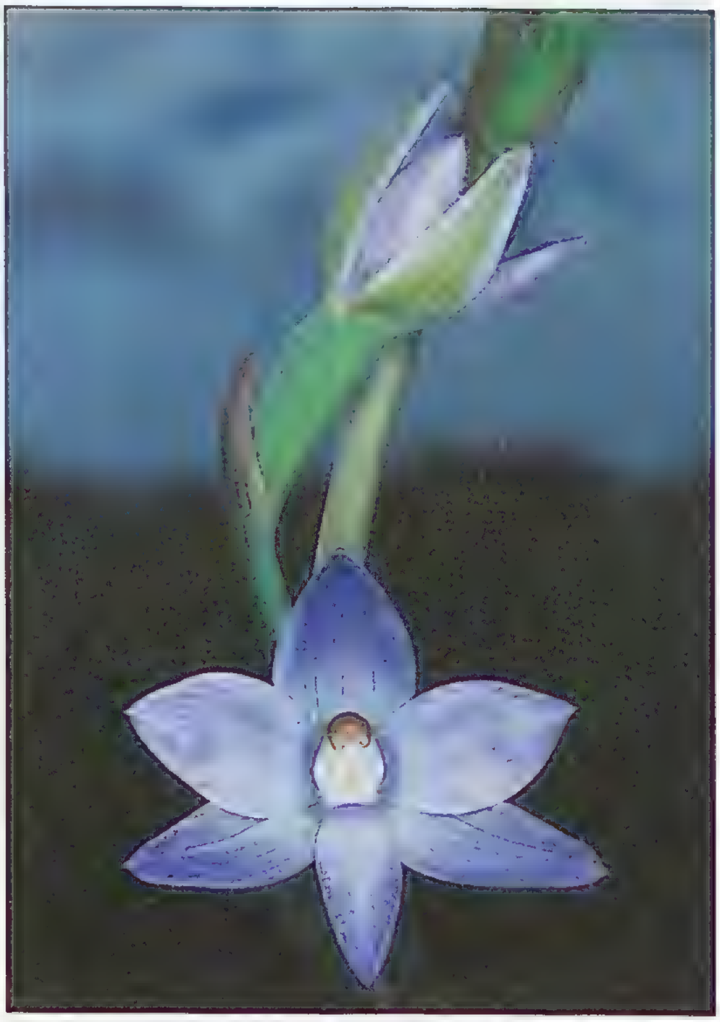


Fig. 5 R. Bates

Thelymitra* sp. aff. *pauciflora
"*bracteata*" from Adelaide Hills, S.A.

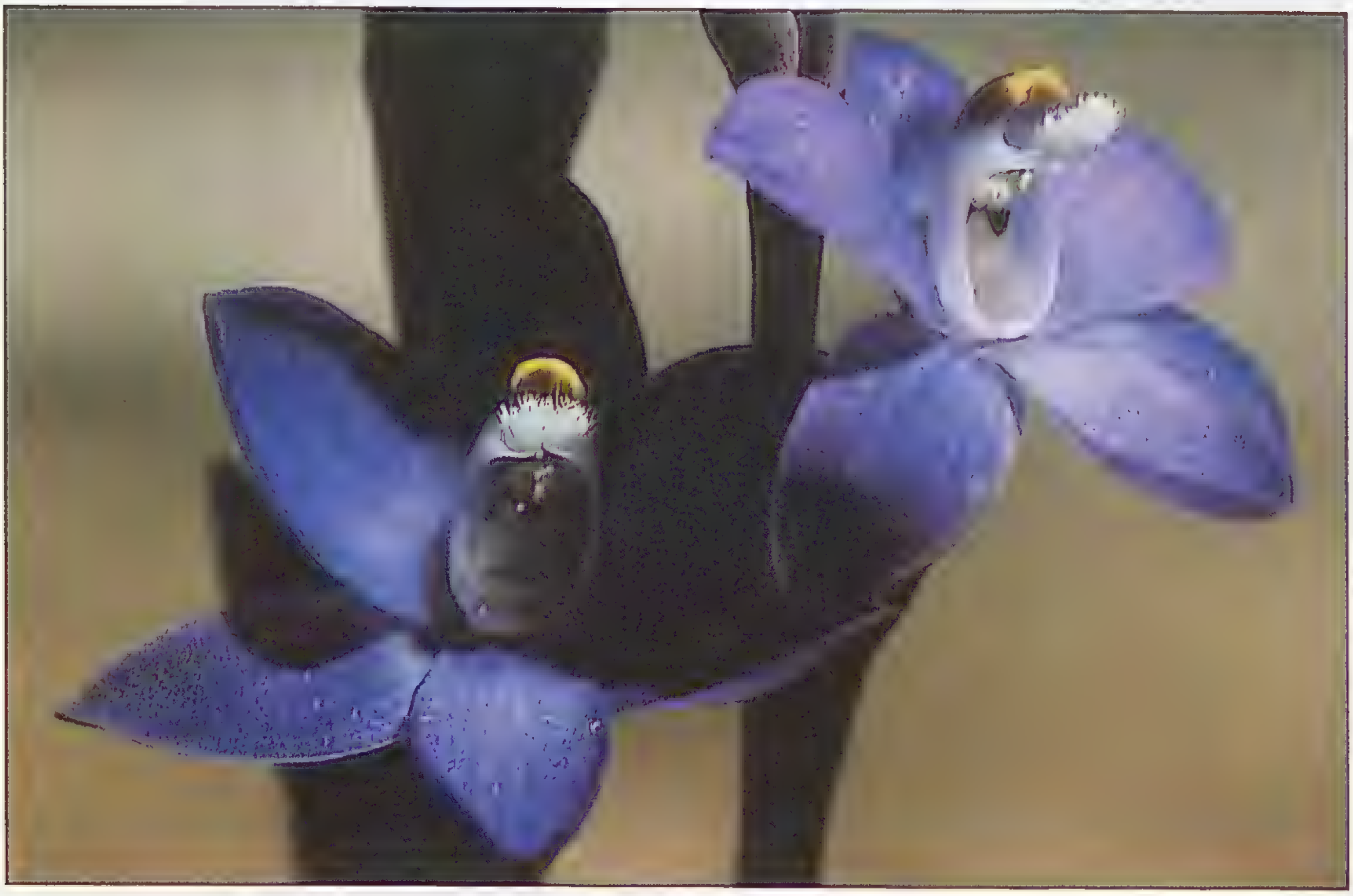


Fig. 6 R. Bates

***Thelymitra* sp. aff. *pauciflora* "Darkie"** from Buchan, Victoria.

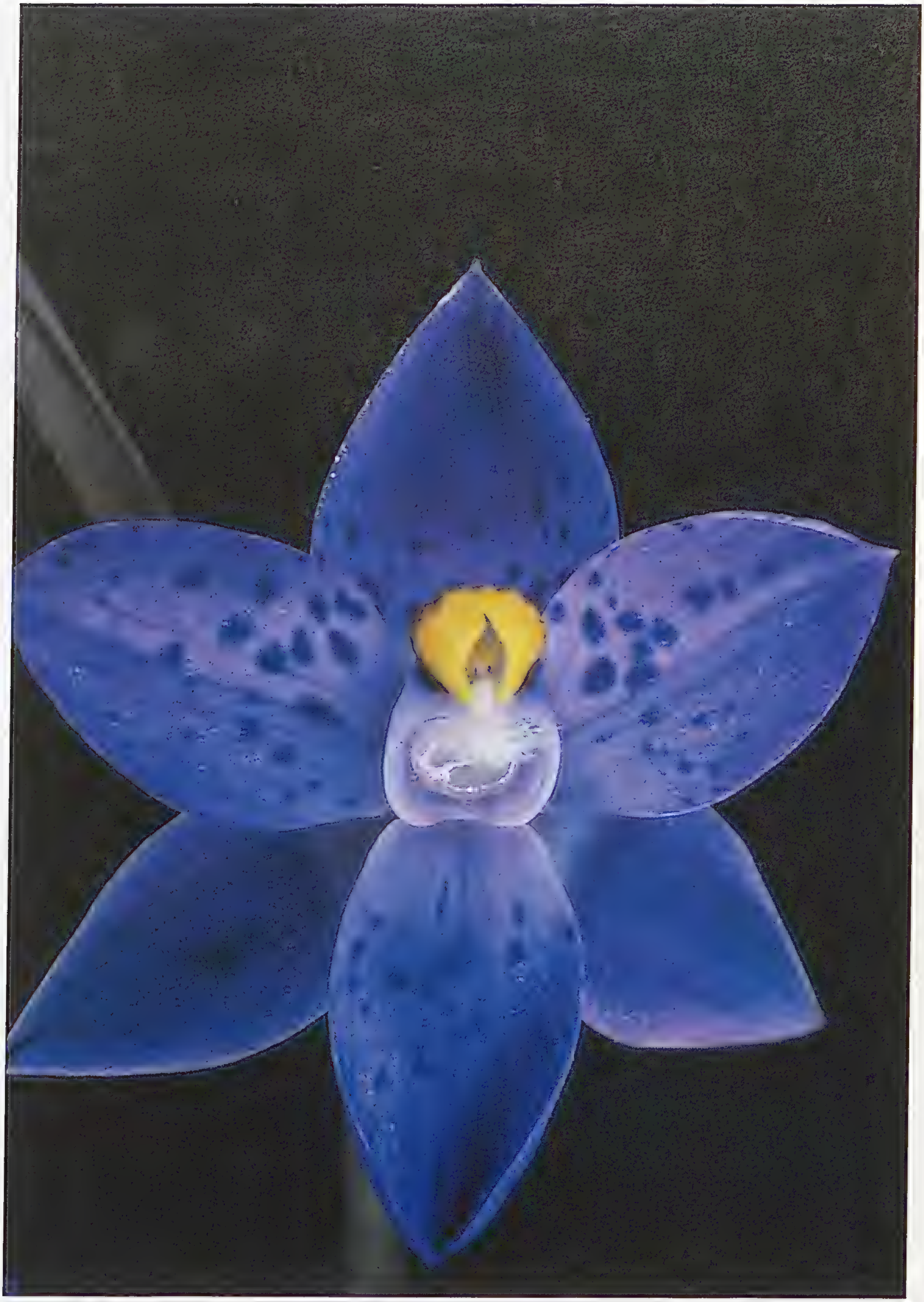


Fig. 7 R. Bates

Thelymitra (*juncifolia x* sp. aff. *pauciflora* "Blue Column") from Adelaide Hills, S.A.

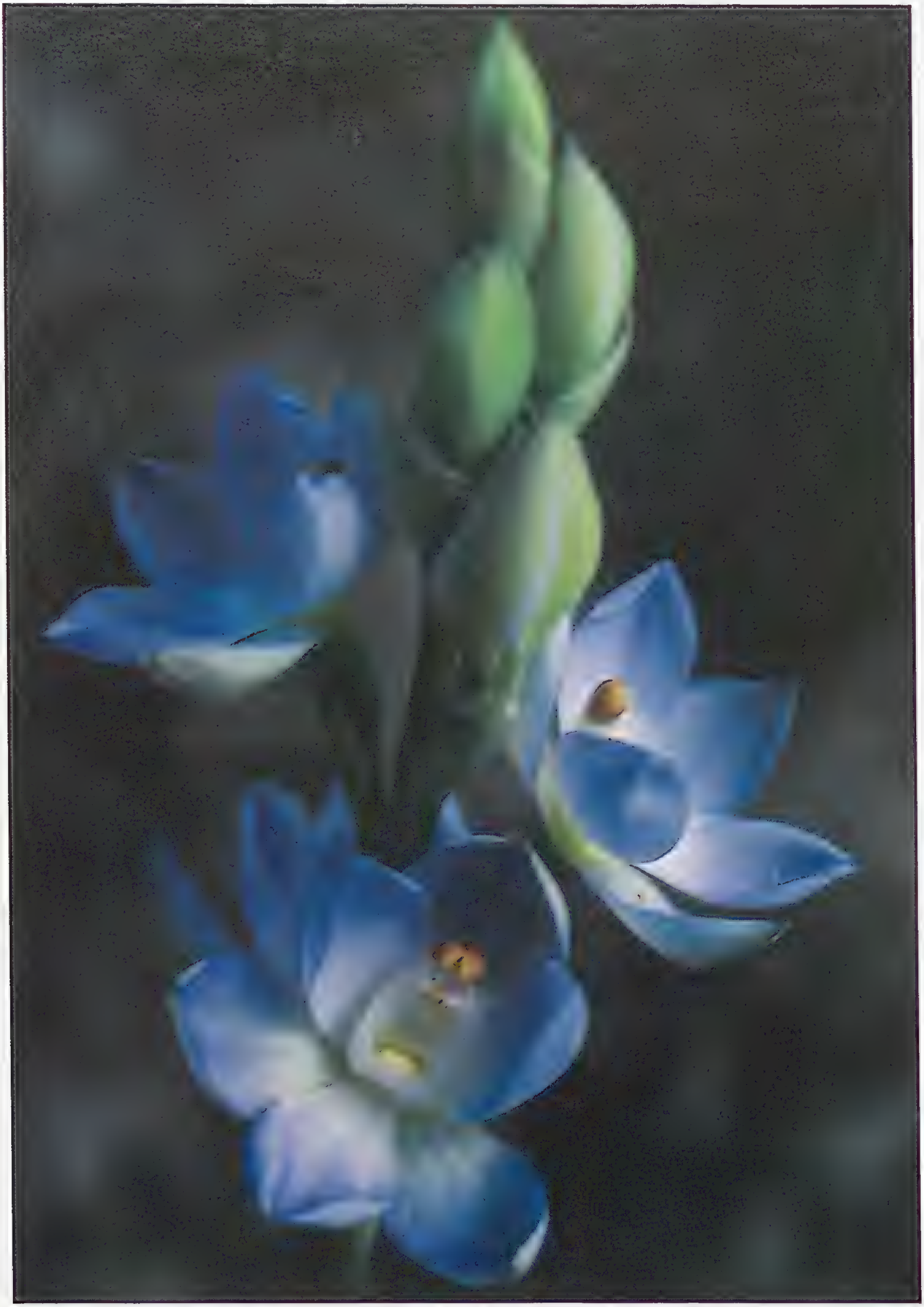
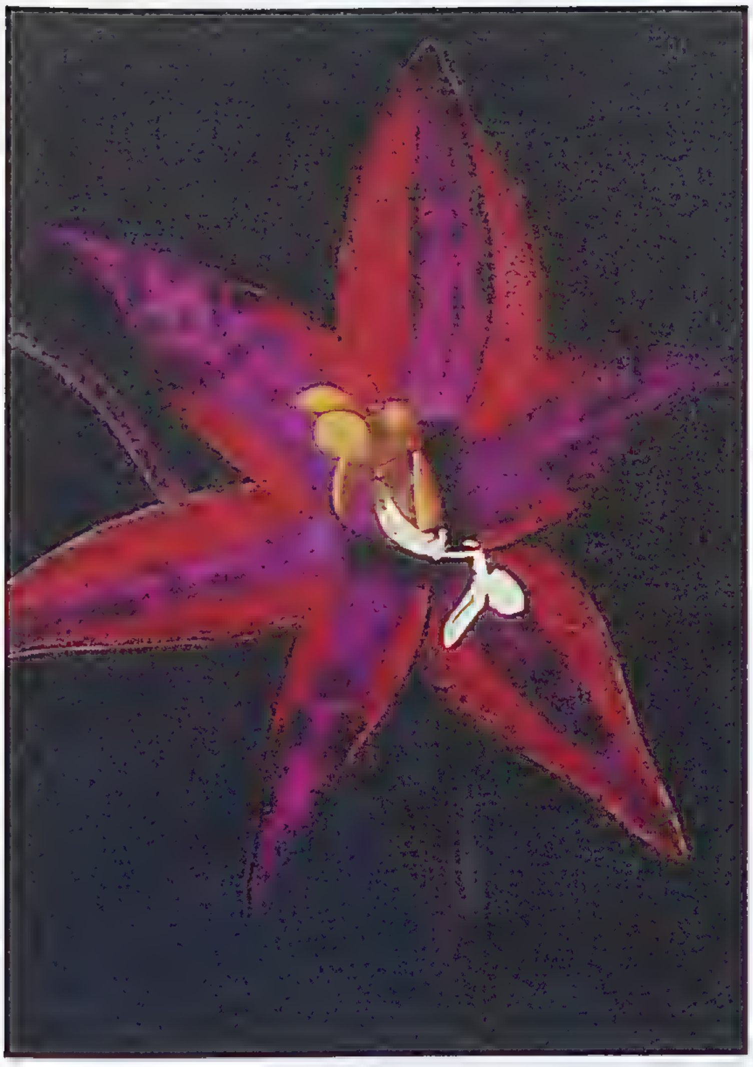


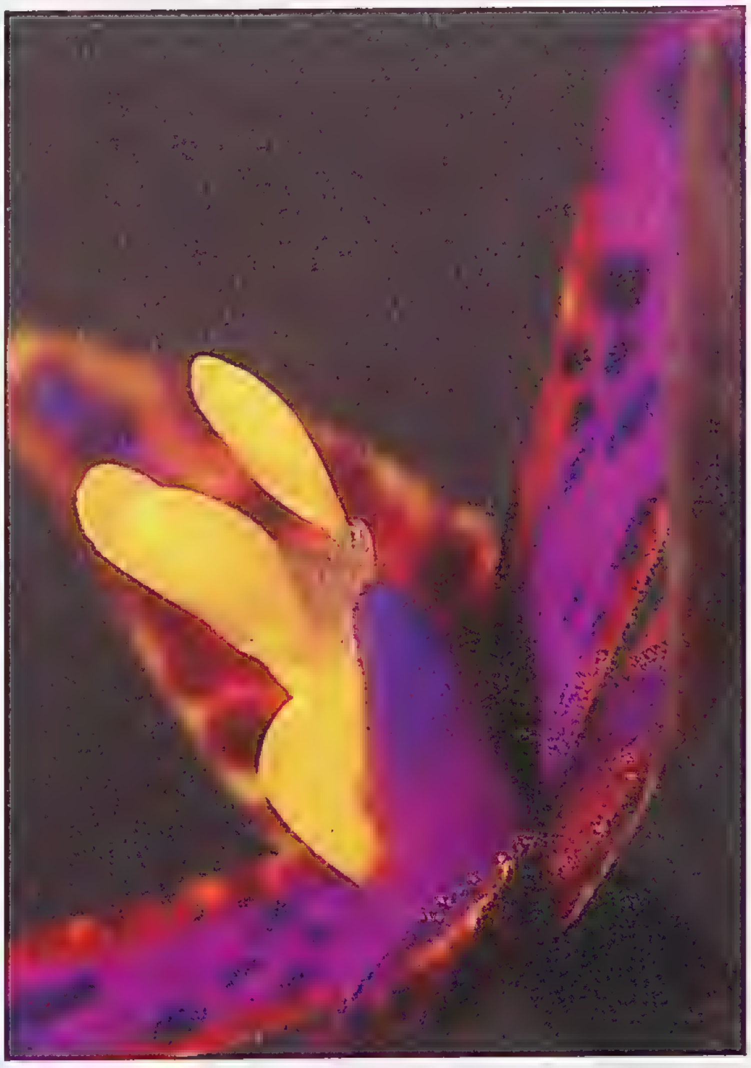
Fig. 8 R. Bates

Thelymitra* sp. aff. *aristata from Scamander, Tasmania.



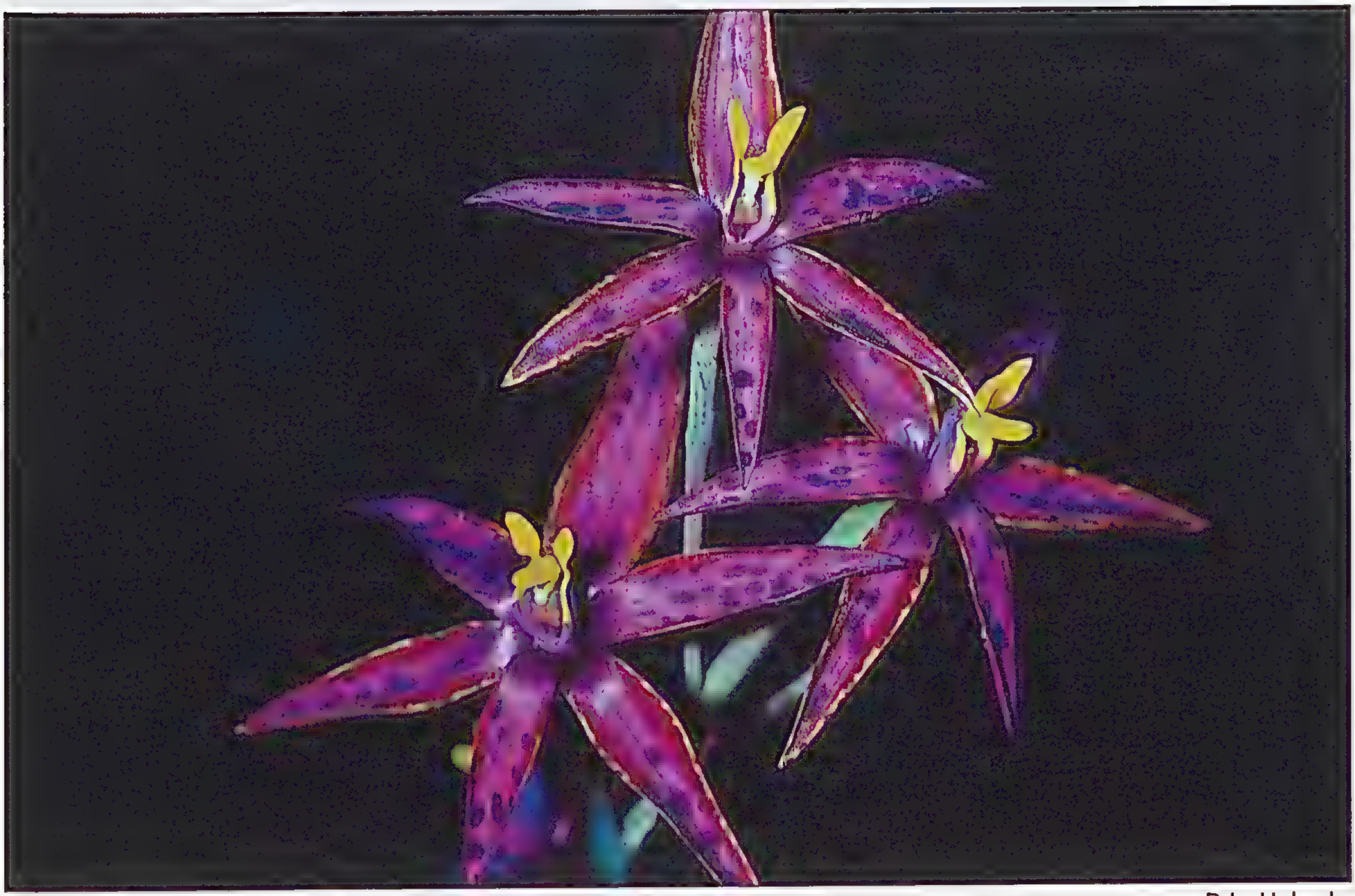
R.L. Heberle

Thelymitra variegata
With pollen removed by unsuccessful insect.



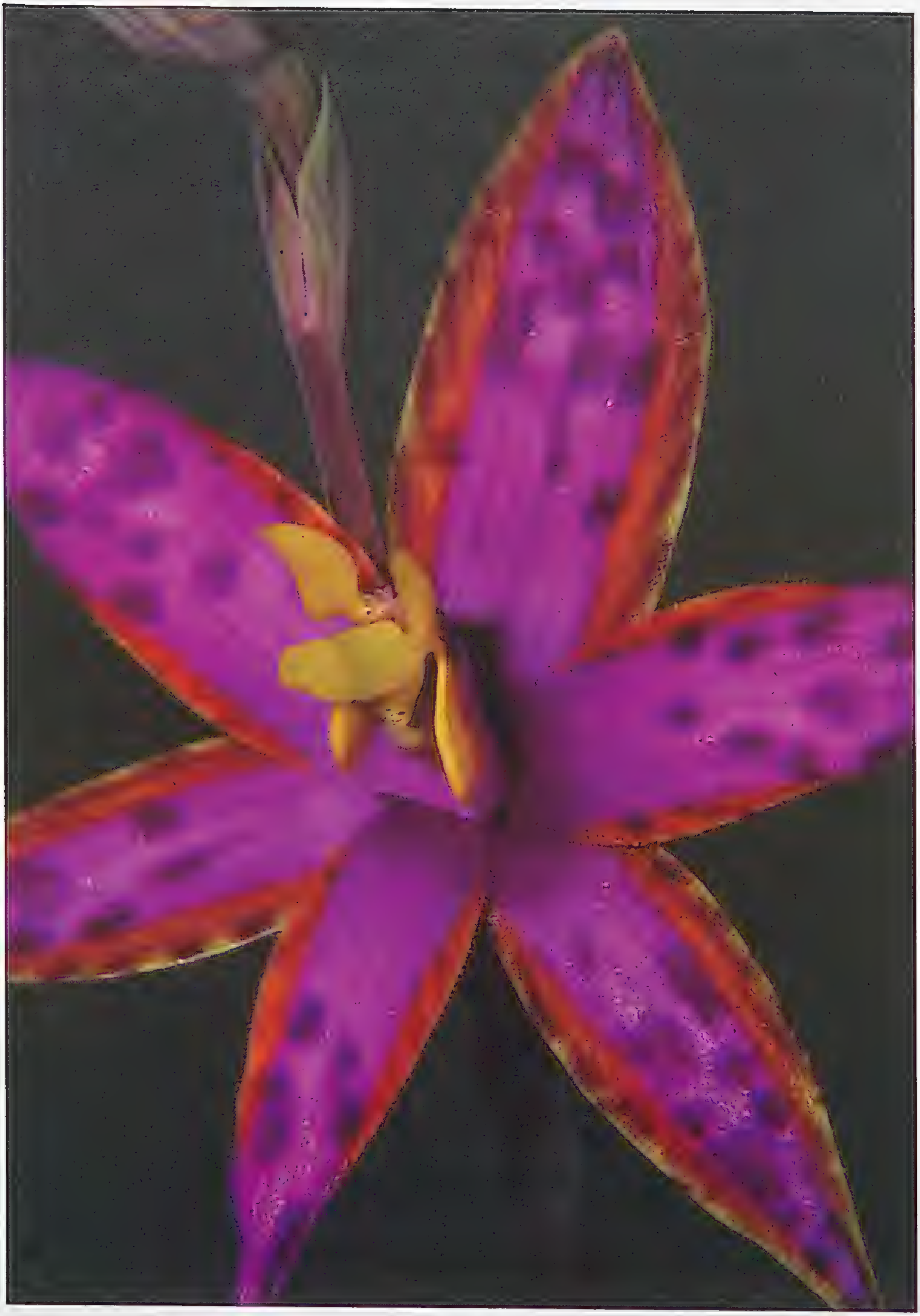
R.L. Heberle

Thelymitra variegata
Showing the crest located at back of column.



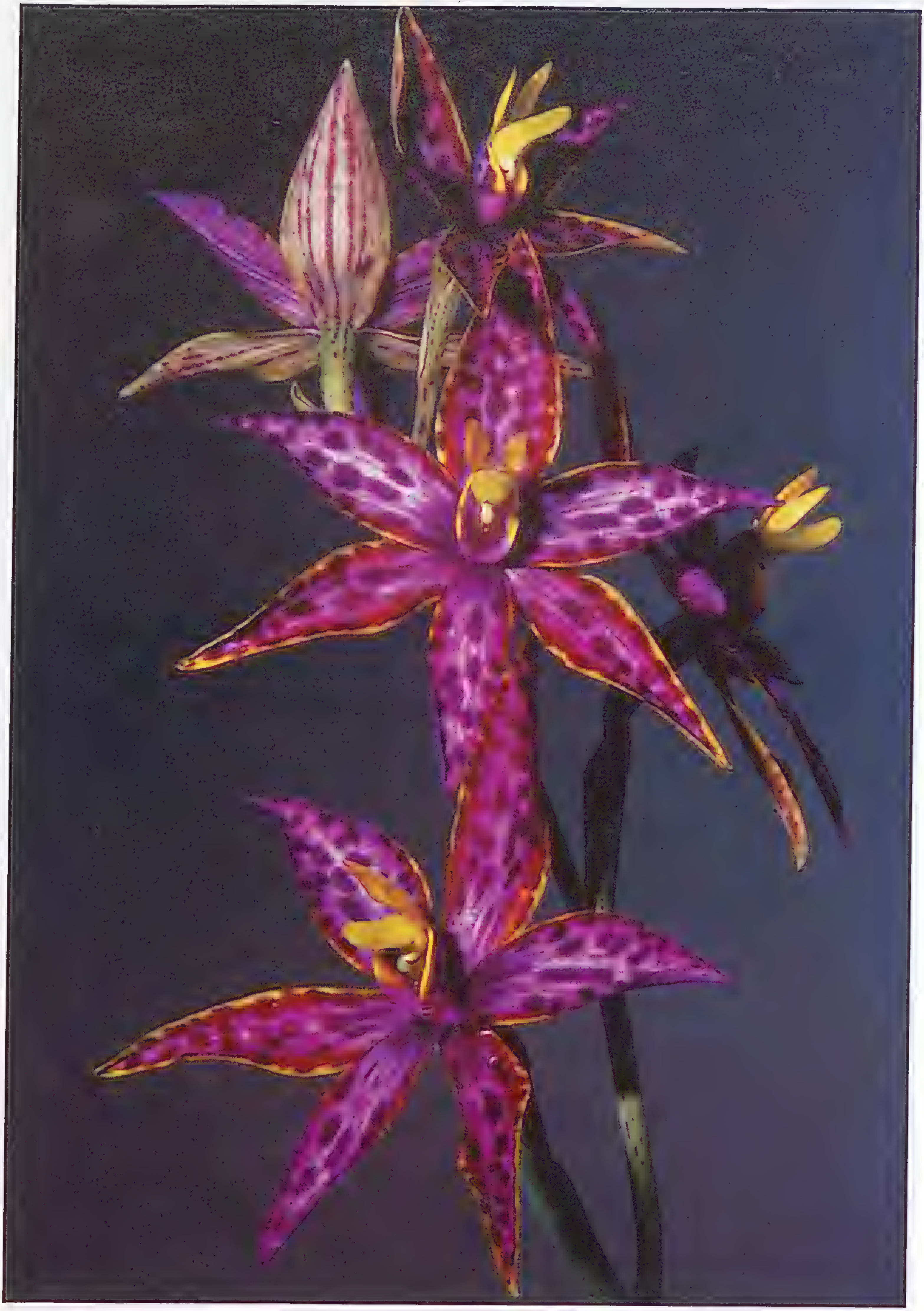
R.L. Heberle

Thelymitra variegata from Albany, Western Australia.



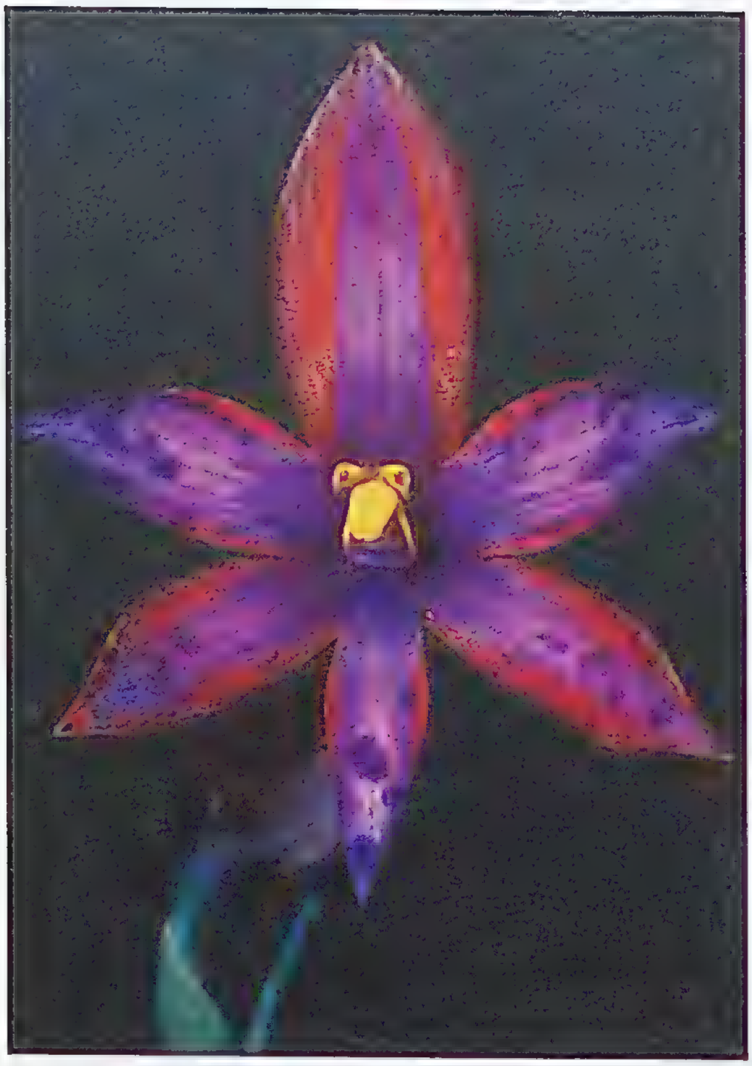
R.L. Heberle

Column detail of ***Thelymitra variegata*** from Gardner River, W.A.



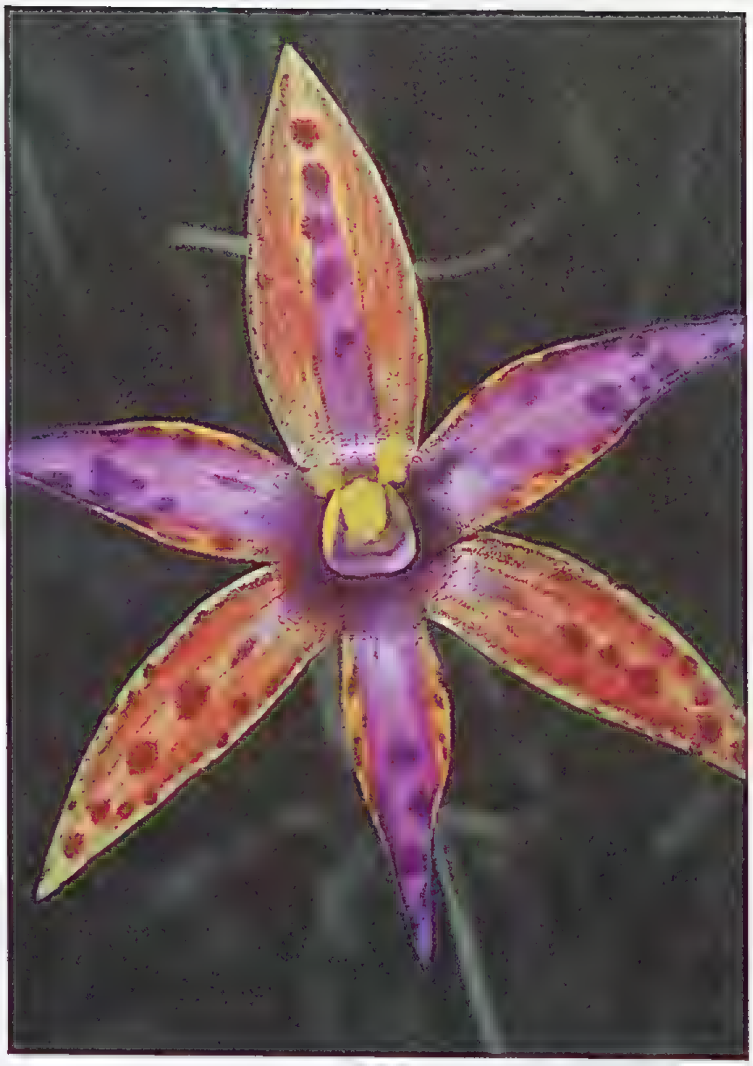
R.L. Heberle

Thelymitra variegata from Capel, south of Bunbury, W.A.



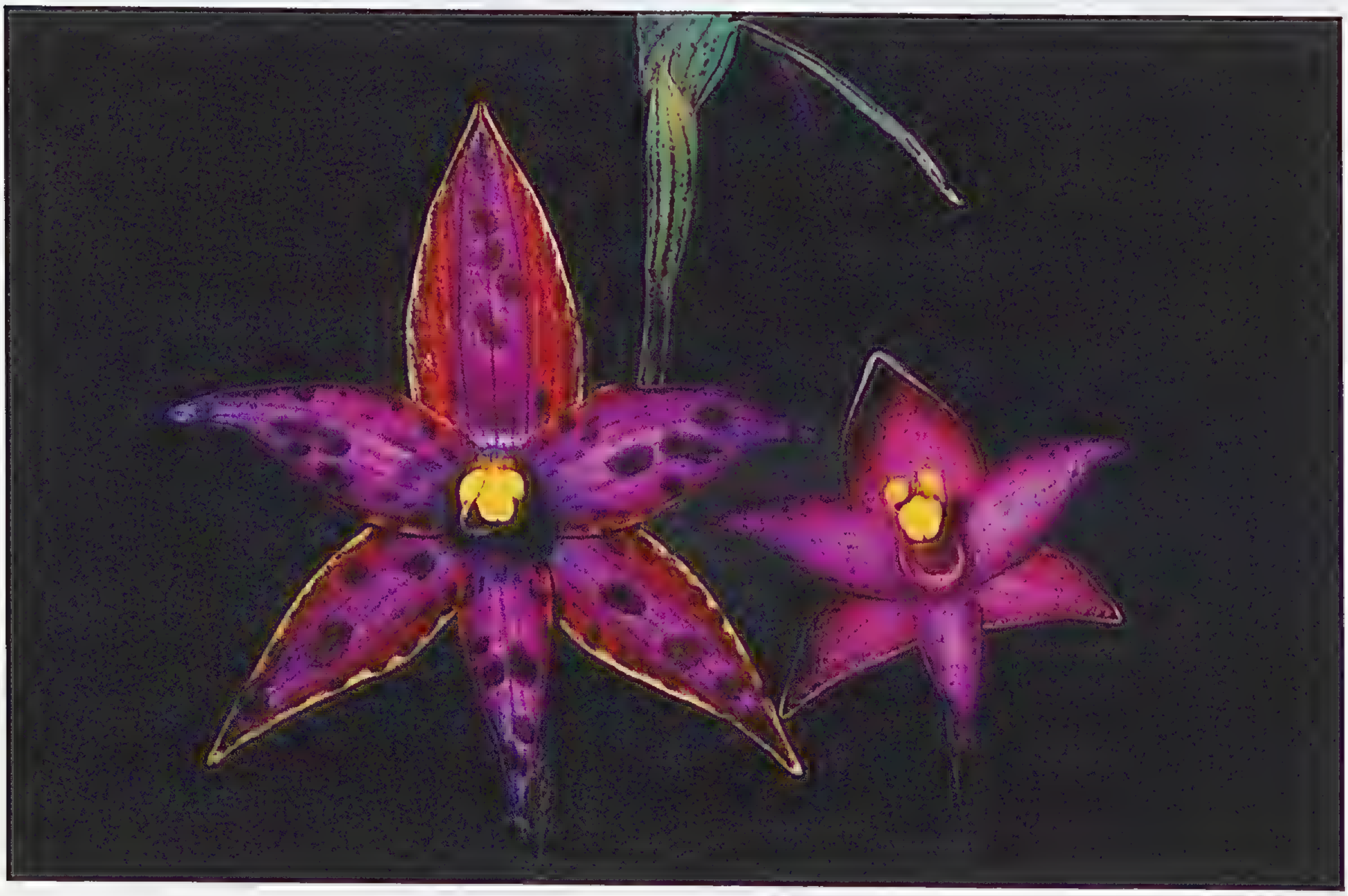
R.L. Heberle

Thelymitra variegata
from Gardner River region, W.A.



R.L. Heberle

Thelymitra variegata
from Gardner River region, W.A.



R.L. Heberle

Thelymitra variegata and ***Thelymitra spiralis*** often grow together.

Thelymitra variegata (Lindl) F.Muell - "The Queen of Sheba"

Ronald L. Heberle,
78 Campbell Road, Albany WA 6330

The species is considered to be the most colourful of all Australian "Sun Orchids" reflecting a riot of colour combinations that can be blotched, speckled, striped or banded or just one colour embracing all the colours of the spectrum with an overall iridescent sheen which has to be seen to be believed.

Whilst there is some controversy about the botanical meaning of the species name, there are no problems with the common name, coined by an anonymous genius that linked the species with the legendary "Queen of Sheba" considered to be the most beautiful woman of her time.

The handsome "star" like flowers open only in warm sunlight is considered to have regular flowers although most have a wider dorsal sepal and a narrower labellum segment. Plants can bare from one to six flowers up to 4cms across. Basal flowers open in rotation upwards; it is not unusual for all flowers to be open at the one time.

Most colonies have a similar colour combination but no two flowers bare the same markings. Occasionally strong colonies have a number of different colours and markings, to view one of these with all flowers expanded is a sight to be remembered.

Apart from colour, the species shows a number of unique features together with the allied species *T.spiralis, T.apiculata* and the Eastern States species *T.matthewsii.* All have spirally twisted leaves (to the left) corkscrew or a slow spiral of two or three. There is a frilly spatula process at ground level from which the very narrow leaf arises.

The erect column coloured blue or purple at the base and golden yellow above terminates with an elongated centre lobe extending forward and is flanked by the erect lateral lobes. There is an inconspicuous crest behind the lobes and a prominent rostellum that extends forward and above the large stigmatic plate. This is pressed hard against the centre lobe that splits from the base at maturity and exposes the pollinias.

The pollen is coherent, flaked and can be extruded, the rostellum is a positive device that prevents self pollination and also makes the removal of the pollen difficult, this may explain why very few fertilised ovaries are observed (in my experience) and could explain why the species though widely distributed is reputed to be less abundant than most other species of the genus.

The distribution is at least from Dongara in the north to east of Esperance throughout the coastal strip with recordings inland from east of Katanning, Tincurrin and with a recent find west of Kulin. A spread of 600kms north to south, and a similar spread west to east.

Once common in the Perth metropolitan area, around the Swan River, Rivervale, South Perth, Como, Canning Bridge and elsewhere, some can still be found at Wanneroo and Jandakot.

In my experience plants have been difficult to culture and flower for two or three years, then non-flowering leaves with tubers withering.

With the advances in culturing terrestrials, particularly in the Eastern States the above results would most certainly be improved on.

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Book Reviews

The Genus Paphiopedilum:
Natural History and Cultivation Volume 1
by Guido Braem and Charles & Margaret Baker

182 pp. 276mm x 226mm Softcover.
Available from Botanical Publishers Inc.,
2501 Old Lake Wilson Road, Kissimmee, Florida 34747, USA.
US$50.00
E-mail: cmbaker@orchidculture.com

There is arguably more interest worldwide in *Paphiopedilum* species than in many other orchid genera. Over the past couple of decades there has been an enormous amount of literature published on the tropical Asiatic slipper orchids.

The catalyst for most of this work was the late Jack Fowlie, who published many first hand accounts of *Paphiopedilum* species in the wild in the respected periodical, *The Orchid Digest*. Much of this work led to Lance Birk's *The Paphiopedilum Growers Manual* in 1983. In 1987, *The Genus Paphiopedilum* by Phillip Cribb was released, followed by Guido Braem's *Paphiopedilum* in 1988. Cribbs work was revised and the acclaimed second edition appeared in 1998.

Paphiopedilum enthusiasts will be pleased to see another alternative updated work on this genus. This time Guido Braem (from Germany) has teamed up with the American couple Charles and Margaret Baker - well known internationally for their popular titles on *Orchid Species Culture*.

This book is the first of a planned three-part treatment, to cover all the known species. A number of topics are discussed early in this work. Two of these I found most interesting were "Some Notes on Taxonomy and Nomenclature" and the (always controversial!) "Infrageneric Taxonomy of the Genus *Paphiopedilum*".

On reading this work, it is clear that Guido has had full control of the taxonomy and plant descriptions, whilst the Bakers have added their trademark extensive "Cultural Recommendations" along with climatic data for a named selected site within (or near) a given species distribution. These cultural notes are very informative and quite extensive, covering aspects such as light, temperatures, humidity, water, fertiliser, rest period, culture media and repotting.

Thirty species (from three subgenera) are treated in this first volume, with 45 sharp (and often full page) colour photographs used which depict these. The subgenera are *Parvisepalum* (including the "bubblegum" or "Chinese" species such as *P. armeniacum, P. delenatii, P. micranthum* etc.), *Brachypetalum* (the "white" species such as *P. bellatulum, P. concolor* etc.) and the popular *Polyantha* (the multifloral "strap-leafed" species including *P. haynaldianum, P. parishii, P. philippinense, P. rothschildianum* etc.) There are also a number of black and white line drawings and clear sketches of floral parts, plus a couple of reproductions of watercolours. Where appropriate, maps are included to show natural distribution.

Eight new taxonomic combinations are described in this volume. All but one (*P. praestans* var. *wilhelminiae*) embrace the term "forma" for albino clones of the species. I have no problem with this, and find it a better interpretation than "variety", as these are generally "one-off" plants, certainly not distinct related populations. But this approach could certainly open the floodgates for anyone wishing to make a name for themselves by simply reclassifying all the "var. *alba*", "var. *albus*" and "var. *album*" within the globes *Orchidaceae*.

I was impressed to see a number of related species treated as complexes. This has happened with *P. maliopoense, P. lowii, P. parishii, P. glanduliferum, P. kolopakingii* and *P.*

philippinense. Some of these include taxa I am happy to accept as "good" species, yet there are others (such as *P. hiepii*, *P. jackii*, *P. lynniae* and *P. topperi*) that I have a question mark over. Many of these I have personally only seen a few examples of and would obviously need to see a larger sample size to be totally convinced. I do accept *P. richardianum* as a valid species, which is easily recognised as being distinct from the related *P. lowii*. But really, *P. topperi* (and the included photographs tend to confirm this) appears to be just a colour variant of *P. kolopakingii*. The new *P. gigantifolium* is also included.

I was not impressed however (page 66) with the unfair dig at Phillip Cribb regarding *P. armeniacum* as a "colour variant of *P. delenatii*". Yes, Cribb made the comment back in 1983 after only seeing the one plant (on its introduction to the western world). But why did this have to be included in this 1998 volume? Both of Cribbs later works accept it as a good species. Really, it would be the same as quoting the adamant stance that Braem had on *P. barbigerum* (as a variety of *P. insigne*), *P. gratrixianum* (as a variety of *P. villosum*), and *P. wardii* (as a natural hybrid between *P. venustum* and *P. sukhakulii*) back in 1988.

I have met Charles and Margaret and corresponded by e-mail with Guido. The one word that instantly comes to mind when describing them is enthusiastic. They are certainly passionate about their orchids, and this is reflected in this fine work. There is an enormous amount of information in this book – both cultural plus the naming and classification of these elite plants. I recommend it to all *Paphiopedilum* enthusiasts and species orchid growers, nurseries and societies. I look forward to seeing the companion volumes.

David P. Banks

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Tropical Orchids of Southeast Asia

by David P. Banks

64 pp. 190mm x 130mm Hardcover. 133 colour plates.
ISBN 962-593-156-2. Available from Hills District Orchids,
P.O. Box 390, Baulkham Hills, NSW 2153 Australia.
AUD$20.00 plus $5.00 postage within Australia
E-mail: dpbanks@ozemail.com.au

David has carefully crafted this little gem for all lovers of Southeast Asian orchids. This book contains 64 pages printed on quality art paper, with 133 full colour reproductions of old and new species and forms. There are many new names to catch up with, with my pictorial favourites being *Bulbophyllum weberi* and *Dendrobium tobaense.*

Each plate has been expertly colour separated from sharp transparencies, combined in correct orientation, with the correct title and printed in register, on art paper! I wish other publishers of orchid books could achieve the same!

The text is succinct and gives expert comment on origin, habitat and cultivation of seventeen different genera from the region. Whilst obviously designed for the Asian and American market and contains some typical spelling aberrations to what we would use in Australia, these would only upset the Editor of the Oxford English Dictionary!

All orchid lovers should carry this compact book. Just dip into its pages and escape to the sane world of beautiful, desirable orchids. I thoroughly recommend this book to all orchid lovers, and lovers of orchid growers!

Murray J.G. Corrigan

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Summer Watering of Orchids

Brian Milligan,
35 Tannock Street, North Balwyn Vic. 3104

Most growers agree that in winter orchids should be watered in the morning, preferably on sunny days when the temperature is rising, so that the foliage will be dry by nightfall. Watering in summer is more controversial.

For a typical summer day in Melbourne, with a maximum temperature around 25°C, I stick to the winter schedule and water in the morning. Foliage that remains wet at night is prone to fungal attack, especially if the relative humidity is high. Glasshouses or similar enclosed structures are always humid at night when the temperature falls.

Watering in hot weather, when temperatures exceed 30°C, and especially when hot, dry northerly winds are blowing, is another matter. Under these conditions, small pots, watered in early morning will be dry by midday. Watering in the evening is much better, as the plants then have all night to absorb water through their roots. If the weather is very hot, I water my smaller pots (up to 5 mm diameter) both in the morning and at night.

The above comments refer to plants (for example Australian native dendrobiums) grown in bark-based mixes. Plants grown in *Sphagnum* moss retain moisture much longer and seldom need watering more often than once every two days, even in the hottest weather.

Some orchids, such as dendrobiums, like to dry out briefly between waterings, whereas *Sarcochilus* do better if their potting mix is never allowed to become completely dry.

Some growers with heated glasshouses water the orchids therein in the evening all year round. Their rationale is that rain falls mainly in the late afternoon or evening in the tropical regions where most of their species orchids grow, and that they are therefore doing only 'what comes naturally'. However, unless the minimum temperature is about 15°C and there is excellent air circulation, I believe that watering at night throughout the year will ultimately lead to attack by *Botrytis* and other fungal infections.

No orchids should be watered at midday in very hot weather. Soft-leafed genera, such as calanthes and *Phaius*, will suffer from leaf scald and so may the new growths of native dendrobiums. Problems could also occur with water sitting in the crowns of potted *Sarcochilus*. Notice how that epiphytic plants do not allow water to stay trapped in their leaf axils, as one of their natural defences against rot.

Also, it's best not to apply liquid fertilisers in hot weather, and never when the roots are dry. Always ensure that the potting mix is damp before applying liquid fertiliser, or you may damage the roots.

I prefer to water one day and to apply the fertiliser on the following day. If you choose a cool spell of weather to do this, then it won't be necessary to water again for several days. This procedure allows plenty of time for the nutrients to be absorbed by the plant, before they are flushed away with the next watering.

Whatever your watering technique, the most important thing to your plants is that they **are** watered. The effort that you put into your orchids during summer will be reflected in how well they flower in winter and spring.

So give them a Happy Christmas too and water them regularly over the holiday season.

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Fourth Australasian Native Orchid Conference and Show Melbourne 5-8 October 2000

The Australasian Native Orchid Conference and Shows are the Premier events on the Australasian native orchid enthusiasts' calendar. With the number of activities that are planned to surround the upcoming 4th Conference, it is no wonder that they are rare jewels that only occur every few years.

Whilst there will not be a moment to spare around the event, the registration price has been kept to a minimum and we feel that the early registration rate of $160 (GST included) is very good value for money.

Registration for the Conference includes: attendance at the 2 day speaker program with leading speakers, the cocktail party, a copy of the book of Proceedings, unlimited entrance to the show and sales area, a Conference badge, and priority on the Conference tours.

As well as the Conference, there will also be a large Show and sales area, totalling over 600 square metres. The Show will also contain an Art and Craft Display and a Photography Competition continuing the theme of our wonderful Australasian Orchids. Then there are orchid and non-orchid tours to provide another opportunity for socialising with orchid enthusiasts from all over Australia and beyond. Then to top it all off there will be the Conference Dinner and other less formal social events.

With the conference less than a year away it is time to consider sending in your registration form, and there is a great incentive to register early! The Early Bird Registration rate (Full $160 and Companion $135 (GST included)) only lasts until 31st March 2000. After March 31st registration will be at the higher rate (Full $200 and Companion $175).

To provide an even better opportunity for groups, a discount is available to Early Bird group bookings (a minimum of 10 registrations per cheque) made prior to 31st March 2000. Registrant $144 and Companion Registrant $122. (GST included). Now that is a good reason to get your club members planning ahead.

The Conference is being held at Karralyka Centre in Ringwood, about 25km east of Melbourne GPO. Car parking facilities are excellent at the Centre and public transport is but a short walk away.

A range of accommodation types in the vicinity has been organised to cater for every budget and special rates have been negotiated. Contact the Conference Secretariat for details and bookings at these reduced rates.

Further information may be obtained from the Conference Secretariat at:

- **PO Box 2152, Templestowe Heights Vic 3107.**
- **Phone 03 9850 9867**
- **e-mail: dickthom@melbpc.org.au**

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Visit the New ANOS website: www.anos.org.au

Fourth Australasian Native Orchid Conference Melbourne 2000 - Show Schedule

CHAMPIONSHIP PRIZES

GRAND CHAMPION OF THE SHOW	**$ 1000**
Champion *Dendrobium* Species	**$ 100**
Champion *Sarcanthinae* Species	**$ 100**
Champion Other Epiphytic Species	**$ 100**
Champion *Caladenia* Species	**$ 100**
Champion Other Terrestrial Species	**$ 100**
Champion *Dendrobium* (*Dendrocoryne*) Hybrid Predominantly - White to Orange	**$ 100**
Champion *Dendrobium* (*Dendrocoryne*) Hybrid Predominantly - Pink to Other Colours	**$ 100**
Champion Other Epiphytic Hybrid	**$ 100**
Champion *Sarcanthinae* Hybrid	**$ 100**
Champion Terrestrial Hybrid	**$ 100**
Champion Specimen Epiphytic Orchid	**$ 100**
Champion Specimen Terrestrial Orchid	**$ 100**
Champion Australasian Orchid	**$ 100**
Champion Seedling of the Show	**$ 100**
Champion Cut Flower	**$ 100**
Champion Floral Art Exhibit	**$ 100**
Ira Butler Trophy nomination (Best Australian Hybrid)	**$ 50**
Bill Murdoch Trophy nomination (Best Australian Species)	**$ 50**

Championship Prize winners also receive a medallion and card

DISPLAYS

Section 1	Floor Display Commercial	**$ 100**
Section 2	Floor Display Interstate Society	**$ 100**
Section 3	Floor Display Local Society	**$ 100**
Section 4	Floor Display Other	**$ 100**
Section 5	Table Top Display	**$ 100**
Section 6	Display of Cut Flowers	**$ 100**

CARD CLASSES

Prizes: First, Second and Third

Australian Species

101 *Dendrobium falcorostrum*
102 *Dendrobium gracilicaule*
103 *Dendrobium kingianum* predominantly white
104 *Dendrobium kingianum* predominantly red/ purple
105 *Dendrobium kingianum* Any Other Colour
106 *Dendrobium speciosum* var. *speciosum*
107 *Dendrobium speciosum* Any Other Variety
108 *Dendrobium tetragonum* complex
109 Other *Dendrobium* Species Section *Dendrocoryne*
110 *Dendrobium* Species Section *Spatulata*
111 Other *Dendrobium* Species
112 *Dockrillia* Species
113 *Sarcochilus falcatus*
114 *Sarcochilus hartmannii*
115 Other *Sarcochilus* Species

116 Other *Sarcanthinae* Species
117 *Bulbophyllum* Species
118 Other Epiphytic Species
119 Seedling Epiphytic Species – First Flowering
120 *Acianthus, Cryptostylis* or *Chiloglottis*
121 *Caladenia* Species
122 *Diuris* Species
123 *Glossodia* Species
124 *Thelymitra* Species
125 Multiflowered *Pterostylis* Species
126 Other *Pterostylis* Species
127 Evergreen Terrestrial Species
128 Other Terrestrial Species

Australian Hybrids

201 *Dendrobium* Hybrid containing *Dendrocoryne* (predominantly White / Cream)
202 *Dendrobium* Hybrid containing *Dendrocoryne* (predominantly Yellow)
203 *Dendrobium* Hybrid containing *Dendrocoryne* (predominantly Orange)
204 *Dendrobium* Hybrid containing *Dendrocoryne* (predominantly Pink)
205 *Dendrobium* Hybrid containing *Dendrocoryne* (predominantly Red / Lilac / Purple)
206 *Dendrobium* Hybrid containing *Dendrocoryne* (predominantly Any Other Colour)
207 *Dendrobium* Primary Hybrid – *D.* Bardo Rose and *D.* X Specio-kingianum
208 *Dendrobium* Primary Hybrid containing *Dendrocoryne* - Other
209 Other *Dendrobium* Hybrid
210 Any Hybrid with *Dockrillia* Parentage
211 *Dendrobium* Hybrid with *Spatulata* Parentage
212 *Sarcochilus* Hybrid predominantly White
213 *Sarcochilus* Hybrid predominantly Pink or Red
214 *Sarcochilus* Hybrid predominantly Any Other Colour
215 Other *Sarcanthinae* Hybrid
216 Seedling *Dendrobium* Hybrid White / Cream / Yellow / Orange
217 Seedling *Dendrobium* Hybrid Pink / Red / Purple
218 Seedling *Dendrobium* Hybrid Any other Colour
219 Seedling Other Epiphytic Hybrid
220 Seedling *Sarcanthinae* Hybrid predominantly White
221 Seedling *Sarcanthinae* Hybrid Any other Colour
222 *Caladenia* Hybrid
223 *Diuris* Hybrid
224 *Pterostylis* Hybrid
225 Other Terrestrial Hybrid

Australasian Species

301 *Dendrobium* Species Section *Spatulata*
302 *Dendrobium* Species Section *Latouria*
303 Any Other Species

Australasian Hybrids

401 *Dendrobium* Hybrid with *Latouria* Parentage
402 Any Other Hybrid

Cut Flower - Species / Hybrid

501 Cut Flower - Australian Species Epiphyte
502 Cut Flower - Australian Hybrid Epiphyte
503 Cut Flower - Australian Terrestrial Species
504 Cut Flower - Australian Terrestrial Hybrid
505 Cut Flower - Australasian Species
506 Cut Flower - Australasian Hybrid

Floral Art

601 Welcome to Melbourne Large arrangement of Native Orchids
602 Wired Work Presentation bouquet of Native Orchids
603 Shoulder Spray of Native Orchids
604 Restaurant Table Centrepiece featuring Native Orchids (Maximum Size 300mm x 100mm)
605 Vase of Native Orchids
606 Arrangement depicting theme of your choice using Native Orchids

NOTES:

Australian Hybrids:

Hybrids with non - Australian parentage either wholly or partly, are not eligible for entry in classes 201 - 225.

Australasian Species:

Includes species from within the ANOS defined Australasian Region with the exception of Australia.

Australasian Hybrids:

Hybrids between Australasian parents only, or hybrids with a mixture of Australian and Australasian parentage.

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Western Australia to Host First International Orchid Conservation Congress

Kings Park & Botanic Garden in conjunction with the Orchid Specialist Group of the Species Survival Commission of IUCN-The World Conservation Union and Botanic Gardens Conservation International are pleased to announce:

The 1st International Orchid Conservation Congress
(Incorporating the 2nd International Orchid Population Biology Conference)
24-28 September 2001, Perth, Western Australia

The Congress will bring together for the first time, orchid conservation specialists, researchers and practitioners, to develop an understanding of global issues in orchid conservation. The Congress will cover topics including phylogeny of the Orchidaceae, population biology, pollination biology, propagation science, germplasm storage, conservation genetics and taxonomy with opportunities for specialist workshops in orchid conservation techniques and orchid recovery programs. Pre and post-conference tours will explore the incredible diversity of orchids and remarkable wildflowers of southwest Western Australia. The first circular will be available in April 2000 and a call for papers will follow soon after. To register your interest in this congress please contact:

The Congress Secretariat
Dr Kingsley Dixon
Kings Park & Botanic Garden
West Perth 6005 Western Australia
Tel: ++61 (0)8 9480 3614
Fax: ++61 (0)8 9480 3641
Email: orchidcongress@kpbg.wa.gov.au

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Letter to the Editor

Dear Sir,

Caladenia maritima

David Jones, in his paper "Eight New Species of Caladenia R.Br. (Orchidaceae) from Eastern Australia", published in *The Orchadian*, Volume 13 Number 1, September 1999, stated that no illustration of this new species was found.

Caladenia maritima is illustrated and described on page 15 of *Orchids of the Anglesea District* (by Everett Foster and Margaret MacDonald) under the name of *Caladenia* aff. *catenata.*

Unfortunately, the printing of the book coincided with the time that David was writing his paper and he had no knowledge that the new species was illustrated in the new publication.

The new species, now known as *Caladenia maritima*, was first noted in one area of Anglesea during late September 1998, when there was an estimate of 150 plants. This year, September 1999, the colony extended over a larger area, with an estimation of 200+ plants.

Yours faithfully,
Everett Foster,
1 Elizabeth Street,
Belmont. Victoria. 3216.

✿

Where Did the Colour Go?

Neville Roper
27 Delves Street, Mortdale NSW 2223

When one considers pollinating a flower to create a new hybrid or even when selecting seedlings off a nursery catalogue there forms, mirage-like in the back of the mind, a vision. For me this vision usually takes the most desirable features of the two prospective parents and combines them to give an idealised image of the best possible outcome. When you buy a lottery ticket you plan to win not lose! I am sure that I am not alone in this because I have read nursery catalogues which advertise each cross with "These should be ..."(insert something from the nursery's mirage-vision)".

The question that all of this raises is - how realistic are these visions? The answer probably lies in two areas-

- plain straight out good luck, we all can fluke it sometimes.
- understanding the genetic battle that occurs after a successful session with the toothpick or, probably more precisely, understanding the genetic contributions most likely to be made by each parent.

Take two cornerstone Australian native crosses that have not generally lived up to the hybridist's vision splendid - *Dendrobium* Delicatum (which technically should be referred to as *D.* Specio-kingianum) and *Sarcochilus* Fitzhart.

Case Number One;
***Dendrobium* Delicatum** (*D. speciosum* x *D. kingianum*)

This cross could create several visions -

- " ...dark red *speciosum* sized flowers with the *kingianum* shape on mammoth racemes produced by compact plants ..." *or*
- "...large golden *kingianum* type flowers on long inflorescences produced by plants that grow like weeds ..." *or what about*
- " ...*speciosum* sized flowers shaped like a *kingianum* that are pure white with a solid purple labellum (since we really can't use the term '*silcockii*' anymore) , one hundred of them on an erect inflorescence ..."

In reality what you are most likely to get is twenty-odd smallish white flowers with varying degrees of pink blush mostly hidden on the back of the flowers. Even when the darkest claret coloured *D. kingianum* is used and put to a yellow or cream "rock lily" there is still a preponderance of these typical "dellie" flowers. Forget flower size and flower count, what I really wonder about is where did the colour go? Not only don't you get claret "dellies" (and pinks are *very* rare) but you don't get yellow ones either.

Unbelievably it seems to go like this;
D. kingianum x *D. speciosum* = *D.* Delicatum
Pink x White = White with a pink blush
Purple x White = White with a pink blush
Pink x Yellow = White with a pink blush
Purple x Yellow = White with a pink blush

At first it doesn't seem to make sense. Has anyone made a dellie using a white *D. kingianum* - if so did they still produce white flowers with a pink blush?

Case Number Two;
***Sarcochilus* Fitzhart** (*S. fitzgeraldii* x *S. hartmannii*)

The vision that I am locked into here is obviously one of crimson red flowers shaped like an award quality *S. hartmannii* on robust, easy growing plants. Lets face it, as a hybridist you don't look towards *S. fitzgeraldii* for its flower shape or robust growth. What most breeders have been chasing are offspring that display their red genes - the more the merrier!

Once again the reality falls short of the vision splendid. Most clones of *S.* Fitzhart tend to be whites with varying degrees of red in the centre of the flowers which rarely, if ever, extends to the tips of the flower segments - of all flowers on an infloresconse not just the odd one. Even the majority of *S.* Fitzhart's bred from the Numinbah Valley (red centred) style *S. hartmannii* and full red *S. fitzgeraldii*, such as 'Lorraine' have comparatively little red colouration on display. Perhaps the greatest improvement in more recent S. Fitzhart crosses has been in the shape of the flowers. Ken Russell's remakes (769) - *S. hartmannii* 'Reefer' (Numinbah type) crossed with *S. fitzgeraldii* 'Lorraine' (full red) and (776) - *S. hartmannii* 'Red Circles' (Numinbah type) crossed with *S. fitzgeraldii* 'Red Vic' (two-thirds red) are evidence of this. Even these don't advertise their colour inheritance but instead proudly declare their improved "fuller shape" so treasured by orchid judges. This outcome further reinforces my curiosity at where did the colour go?

At the 1997 ANOS Port Hacking Group Sarcanthinae Show a possible answer became apparent. In the 'Best *Sarcanthinae* Seedling' class (seedling classes are always the most interesting) were several small plants of *S.* Fitzhart from a sibling cross. These plants had flowers with more than the usual degree of red colouring, some were very close to being full reds. More seedlings from this cross appeared in the same section in 1998 and, if anything, they were better - having more red in the flowers, a more intense colour displayed in crisp well-defined markings. One was the elusive 'full red'. These were bred by Ken Russell and were the result of a cross between two siblings from his earlier (769) cross. These interesting little plants have led me to think that the colour was there all along - it was just hidden by some more dominant white genes and they only got to express themselves in the next generation when both parents contributed a similar set of red genes.

'Nowhere' seems to be the answer to my earlier question of "Where did he colour go?". The colour genes were there but they were just sort of out-muscled by some more dominant white genes which had forced them into the background - at least in the case of *S.* Fitzhart.

This may well provide some insight into the *S.* Fitzhart situation, but could it also offer an explanation for the *D.* Delicatum situation? In the absence of a true *D.* Delicatum sibling cross, there is only one "Dellie" outcross that I can refer to for comparison. It was collaboration between Kevin Wilson and Ken Russell who provided cultivars 'Michael' and 'Dungog' respectively to create Ken's (105) cross. The resulting seedlings produced better than average flowers but they did not boast an inheritance of *D. kingianum* colour genes. Some hinted at it with varying amounts of pink on the backs of the flowers but there were no true solid *D. kingianum* type pinks or purples despite the use of a dark claret "kingie" to make at least one of the original "Dellies".

Not being a geneticist, I cannot offer an authoritative opinion as to the causes of the variation in the colour outcomes between these two hybrids. At any rate the limited number of plants that I have seen and the small number of sibling crosses available would render any conclusions unreliable, however I offer the following as a possibility.

The answer as to why a *S.* Fitzhart sibling cross is able to express increased colour while a *D.* Delicatum outcross isn't able to do the same, may be locked up in the genetic makeup of the original parent species. In the case of *S.* Fitzhart both parent species (*S. hartmannii* and *S. fitzgeraldii*) carry some red colouration in their flowers. Admittedly this may be very a small amount in some forms of *S. hartmannii* but it does evidence the ability of both parents to display red colouration and also the potential to contribute red genes to *S.* Fitzhart. These genes may be hidden to some extent in a straight *S.* Fitzhart but become more visible in the sibling cross.

Unlike *S. hartmannii*, *S. fitzgeraldii* and *D. kingianum* most *D. speciosum* have no red colour on their flower segments apart from the labellum (implicit here is my lack of experience with the so-called "red factor speciosums" and the hybrids bred from them). This would mean that "dellies", unlike *S.* Fitzhart, get their red/pink colour genes from only one parent. A possible further complication to this could be an inherited inability to express the colour genes contributed by *D. kingianum*. The absence of *D. kingianum* colour intensity in the vast majority of "dellies", even those from an outcross, may be the result of this 'colour inhibition' on the part of *D. speciosum*. The colour genes from one parent are there but they have been denied greater exposure by some more-insistent white or cream ones originating from the other parent. Once again 'nowhere' seems to be the answer to my opening question as to 'Where did the colour go?'.

The next time you are contemplating creating a new *Sarcochilus* hybrid or you are perusing the latest catalogue with a view to parting with some of your hard earned, I suggest that you include *S.* Fitzhart somewhere in your plans. That is, of course, if you wish to reduce the likelihood of having to ask "where did the colour go?" It seems to me that *S.* Fitzhart is a better parenting proposition than either of its parents when looking for good strong colours without sacrificing too much in the shape department. If there are any lingering doubts about the potential of *S.* Fitzhart, then check out some its established offspring when they appear on the showbench next season. The following *S.* Fitzhart hybrids will not fail to impress; *S.* Jeanne (x Weinhart), *S.* Heidi (x *hartmannii*), *S.* Burgundy On Ice (x Judith), *S.* Cherie (x *fitzgeraldii*), *S.* Charlotte (x Marion), *S.* Judith (x Melba), *S.* Pippy (x Peach Spots), *S.* Tigress (x *spathulatus*) and *S.* Tigersun (x Tigress).

So what of the role of *D.* Delicatum in creating new hybrids? To be honest I am not so optimistic about its ability to transmit its parents colour. At this stage I have no plans for it in my breeding program simply because I don't own a "Dellie" I consider good enough to breed with. But this could all change with my next visit to the 'First Flowering Native Seedling' class at the upcoming spring shows.

****

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		21935.18

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		50085.34
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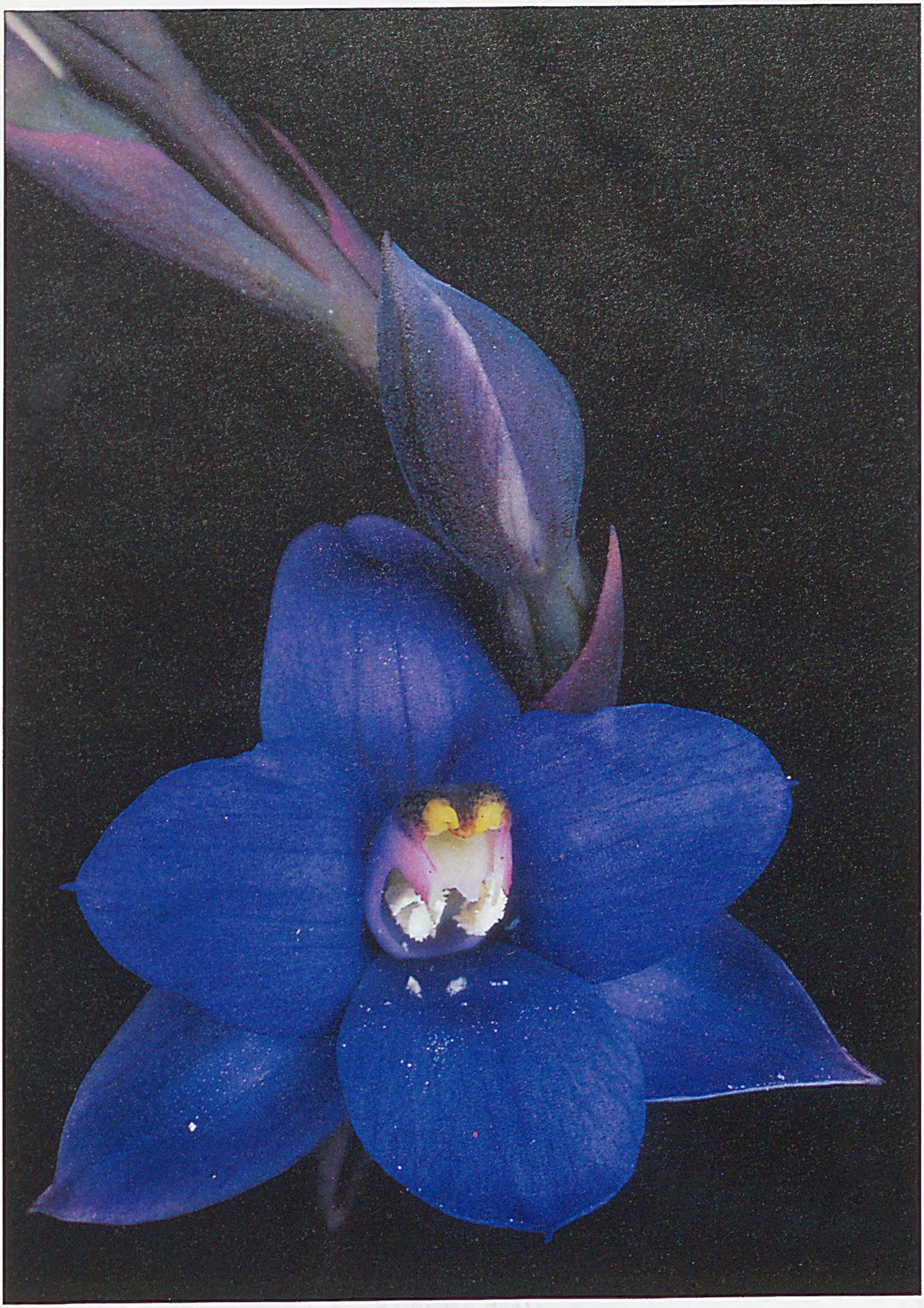

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- **ANOS Townsville**, P.O. Box 1147 Aitkenvale 4814. (07) 4778-4311. Meetings 8pm, 1st Tue. each month. Townsville Orchid Society Hall, Pioneer Park (opp. Willows Shopping Centre), Thuringowa.
- **ANOS Wide Bay**, P.O. Box 15 Tinana 4650. (07) 4122-1251. Meetings 7.30pm, 4th Wed. each month (except Dec.). Swimming Club Hall, Burrum St., Howard.
- **Native Orchid Society of Toowoomba**, P.O. Box 2141 Toowoomba 4350. Meetings 7.30pm, 1st Fri. each month. Red Cross Hall, Hall Lane (off Neil St.) Toowoomba.

VICTORIA

- **ANOS Geelong**, 1 Elizabeth St., Belmont 3216. (03) 5243-4286. Meetings 8pm, 2nd Wed. each month. Uniting Church Hall, Regent St., Belmont.
- **ANOS Victoria**, P.O. Box 2685 Cheltenham 3192. (03) 9954-7692. Meetings 8pm, 1st Fri. each month. Demonstration Hall, Burnley Horticultural College, Swan St., Burnley.

SOUTH AUSTRALIA

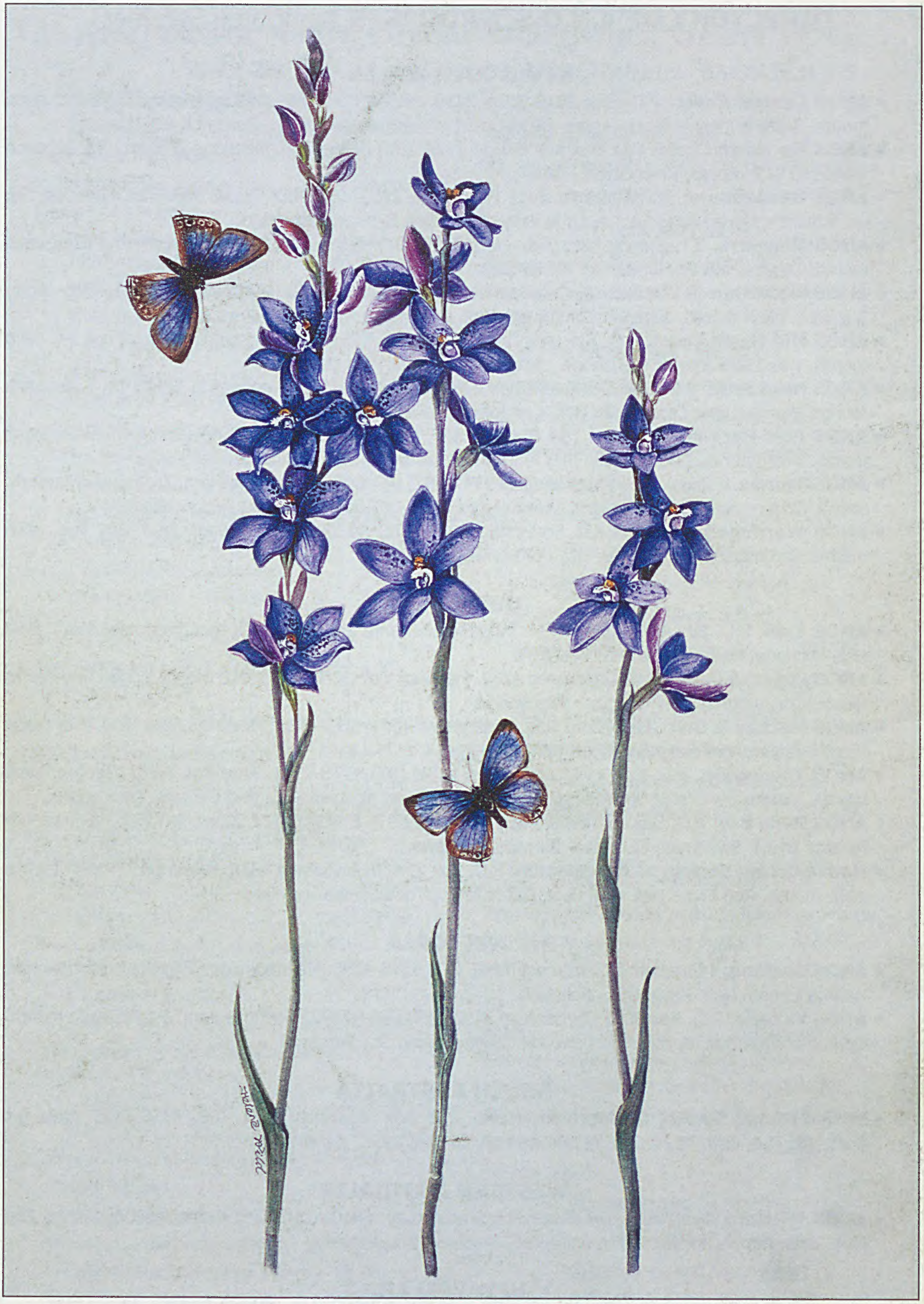
- **Native Orchid Society of South Australia**, P.O. Box 565 Unley 5061. (08) 8356-7356. Meetings 8pm, 4th Tue. each month. St. Matthews Hall, 67 Bridge St., Kensington.

WESTERN AUSTRALIA

- **ANOS Western Australia**, 95A Ewen St., Scarborough 6019. (08) 9341-6709. Meetings 8pm, 2nd Mon. each month. Wilson Community Hall, Brailbrise Rd., Wilson.

NEW ZEALAND

- **ANOS New Zealand**, 20 Fairlands Ave., Waterview, Auckland, New Zealand.
- **ANOG**, 51A Glenharrow Ave., Christchurch, New Zealand. (03) 342-7474.
- **New Zealand Native Orchid Group**, 22 Orchard St., Wadestown, Wellington, New Zealand.



Thelymitra ixioides

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